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ALL THE NEWS FROM CES 2019

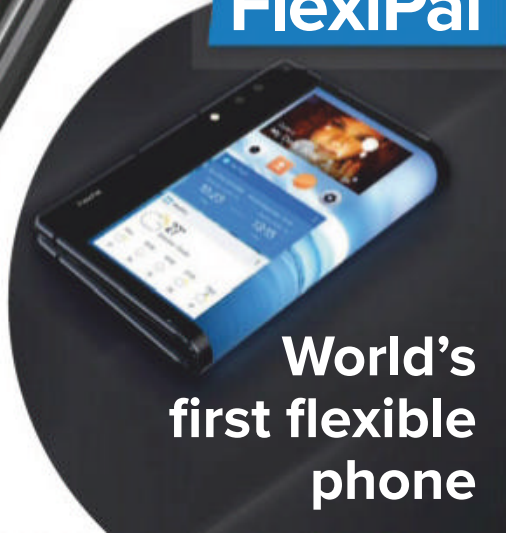
ANDROID ADVISOR

ISSUE 59

Asus ROG Phone REVIEW

An insane gaming smartphone

Royole FlexiPai



World's first flexible phone

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NEWS

Android at CES 2019

The big show wasn't all laptops and chips. MICHAEL SIMON reveals eight intriguing announcements you might have missed

As we look back at CES 2019, two things are certain: we won't be able to afford one of LG's jaw-dropping roll-up OLED TVs and Android is poised for another big year. While we might not have had a look at Samsung's folding phone yet (though we did get our hands on Royale's FlexPai, see **page 24**), there were plenty of low-key announcements in Las Vegas that could have a big

impact on the rest of the year. From Google Assistant to Android TV, here are eight CES announcements that might have slipped under your radar.

1. Google Assistant

Google didn't bring its heavily rumoured Pixel 3 Lite to CES, but it did introduce a bunch of new Google Assistant tricks. Along with a new Interpreter Mode on Google Homes and Smart Displays that offers real-time translation of conversations in dozens of languages, you'll be able to check your flight details and get your boarding pass using Assistant on your Android phone. But the most useful new Assistant feature for Android phones is on the lock screen. On Pixel phones, 'Hey Google' works even when your phone is locked and now Google is bringing that functionality to all Android phones. So you won't need to unlock your phone anymore just to set an alarm. For our guide to Google Assistant see **page 105**.

Why it matters: This could mean Google is beginning to loosen the reins on Pixel-exclusive features.

2. Nubia Red Magic Mars phone

There weren't a ton of phones unveiled at CES this year – they're all being prepped up for MWC (see our MWC special next month) – but there was one that caught our eye, if for no other reason than the name: Red Magic Mars. Made by Nubia, it features a Snapdragon 845, a 6in LCD screen, up to 10GB of RAM, a liquid cooling system, and a 3,800mAh battery, but what's most interesting about the Red

The LED strip on the rear of the Red Magic Mars has 16.8 million colour options

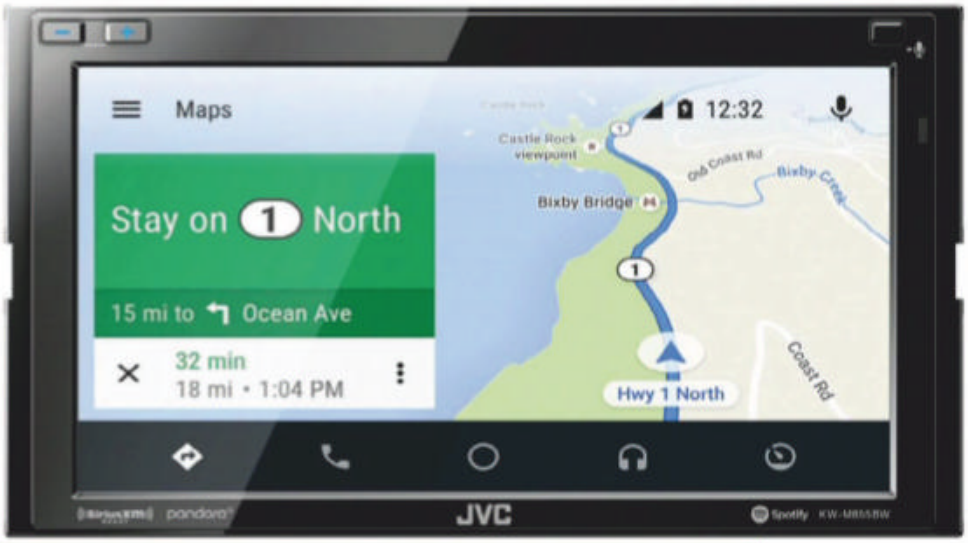
Magic Mars isn't what's on the inside. It's two unique features on the case. Near the top you'll find a pair of customizable touch-sensitive 'shoulder' buttons that add extra controls for gamers, and a rear-facing LED strip with 16.8 million colour options. And the really cool part? It's coming to the UK, with prices starting at £409.

Why it matters: After the Razer Phone 2 and Asus ROG phone landed in 2018, gaming phones are becoming a thing. So it's good to see someone make one that doesn't cost as much as an iPhone.

3. 5G connectivity

As expected, 5G was one of the big buzzwords at CES this year, even if we're still months away from actually being able to buy a 5G phone. But rest assured they're coming. At CES, Qualcomm announced that more than 30 5G handsets will arrive in 2019, a significant jump from the previous estimate of 20.

Why it matters: We have a lot of questions about 5G, but there's a lot to look forward to.



JVC has announced that its KW-M855BW in-car display will support wireless Android Auto

4. Wireless Android Auto

Android Auto has slowly become one of the best infotainment systems, with solid app support, Google Assistant integration, and fantastic hands-free navigation. At CES, several stereo makers unveiled new head units that support Android Auto, including the first wireless option in the JVC KW-M855BW. That means you don't have to bring a USB-C cable along to beam Android Auto to your car's screen. And if your phone is equipped with Miracast, you'll even be able to play video to the 6.8in display (though you'll need the parked with the emergency brake engaged to do so). It also allows for dual phone pairing and high-resolution audio playback, feature we'd love to see come standard in 2020 cars.

Why it matters: A third-party deck offering wireless connectivity isn't quite as good as the full-dash

Android Automotive system Google keeps teasing, but it's a step in the right direction.

5. Bixby 2.0

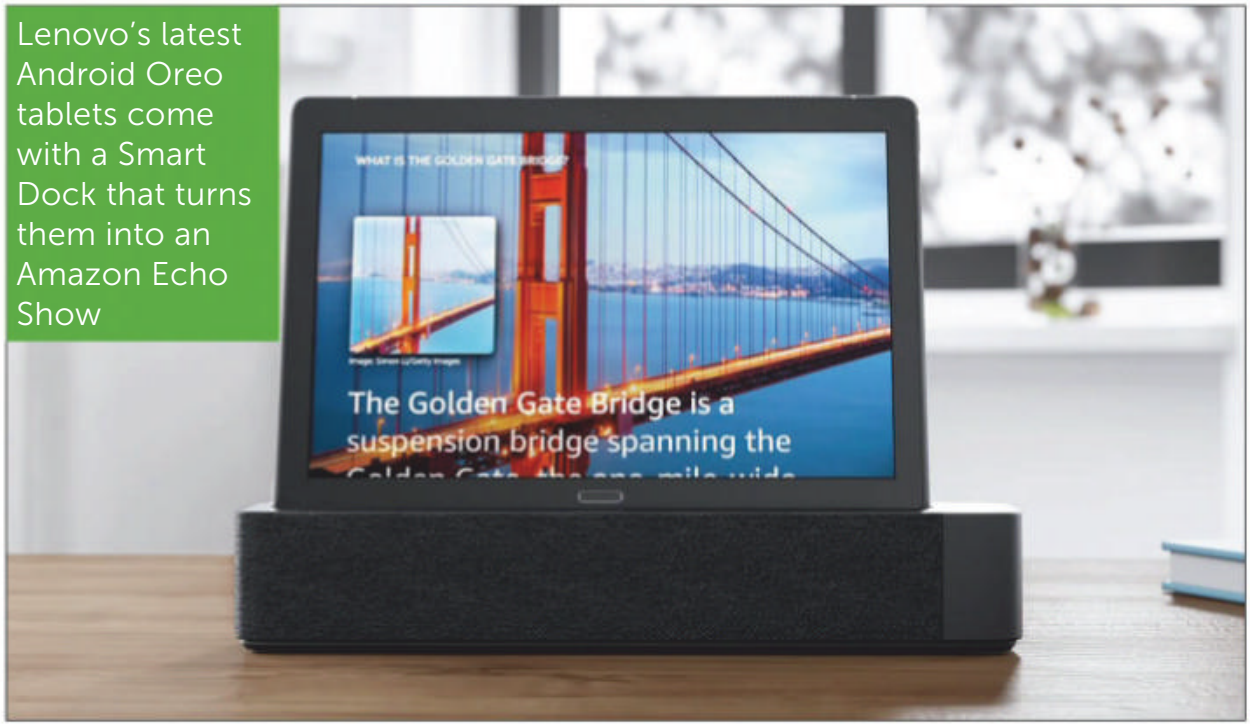
Bixby has been the brunt of too many punchlines to count, but nevertheless Samsung persists, with Bixby 2.0 landing on phones late last summer. The only problem was it broke some functionality with third-party software, namely Maps, Gmail, Play, and the rest of Google's apps. During its CES keynote this year, Samsung slipped in some good news: support is coming back. It's not clear exactly how deep the integration will go, but previously you could use the assistant to do things like get directions, download apps, and show messages from a specific sender. Now if only Samsung would let us remap the Bixby button on the Galaxy S10.

Samsung announced that Bixby is set to make a return

Why it matters: For all of our henpecking, Bixby actually isn't half-bad, but it's kind of a non-starter without support for Google apps. So we're glad to see it return.

6. Tablets as Alexa speakers

Android tablets aren't generally a thing we get overly excited about, but Lenovo is trying to change that by turning them into smart speakers. They don't run Google Assistant, however – they run Alexa. While Lenovo's new Android Oreo tablets (see **page 29**) are nothing too special on their own, with 10in screens and Snapdragon 450 processors, they become something more when charging. Pop them into the bundled Smart Dock and they'll transform into a veritable Echo Show, with a pair of 3W speakers and three far-field microphones.



Lenovo's latest Android Oreo tablets come with a Smart Dock that turns them into an Amazon Echo Show

Why it matters: Visually, it's is a huge improvement over last year's model and much cheaper to boot.

7. Android TVs

Every time we think Android TV is ready to go off the air, something comes along to give it new life. At I/O, Google promised a "renewed focus" on the platform and we met the JBL Link Bar, a Google Assistant-powered soundbar with Android TV baked inside that's finally releasing this spring. And now to kick off 2019, we have lots of Android TVs on the way: Sony, Hisense, Philips, TCL, Xiaomi, JVC, Toshiba, and others all announced new sets at CES with Android TV and Google Assistant built in. And it's no coincidence that developers in January also started to receive their ADT-2 Android TV development kit and dongle for Android 9 Pie integration. So stay tuned.

Why it matters: Even with stiff competition from Roku, Amazon, and Apple, Android TV is still showing that it can compete with the big players.

8. Scallop 2 Wear OS watch

Fossil has been the quiet flag bearer for Android Wear/Wear OS, and CES has traditionally been its launch pad for new models. Fossil didn't bring the slate of watches that it usually brings, but there is one notable model: the Kate Spade Scallop 2, named for its etched bezel design. New this year is NFC for Google Pay, a heart-rate sensor, GPS, and 3ATM water resistance so you don't have to take it off when you go swimming. The only thing that hasn't changed is the price: it still starts

The Scallop 2 has NFC, a heart-rate sensor and 3ATM water resistance

at $295 (£tbc), which is much more palatable with these features. Our only complaint is that it still uses the older Snapdragon 2100 chip rather than newer 3100 one, but it's still an impressive update.

Why it matters: Wear OS is still looking for a leader, but it's still a good sign that women's watches will finally be getting the same features as men's.

NEWS

Meizu and Vivo reveal ‘holeless’ phones

New smartphones announced with no audio jacks or charging ports. MICHAEL SIMON reports

If *Seinfeld* was the first show about nothing, the Meizu Zero is the first phone about nothing. Ahead of Mobile World Congress, the phone maker has teased the world’s first ‘totally seamless’ handset that does more than dump the headphone jack: it gets rid of every single port, button, and slot. That

announcement was shortly followed by Vivo's own portless concept, the Apex 2019.

That means there's no way to charge them without a pad, no way to connect a set of wired headphones, and no way to swap out the SIM card. Heck, you can't even raise the volume without feeling your way around the pressure-sensitive sides. They're basically the dystopian version of the iPhone 7. And you thought Apple was courageous.

What the Zero does have is a 6in HD+ OLED display, a Snapdragon 845 processor, and a dual 12- and 20Mp camera, while the Vivo ups the ante further with the newer 855 processor, 12GB of RAM and 5G, all impressive specs. Both phones will come with at least 128GB of storage, which is good because there isn't an SD card slot. Meizu also kindly includes a wireless charger in the box because, well, there's no other way to charge it.

But the selling point of the Zero and the Apex isn't what comes on the side, it's the 'one-piece' design. There's no denying the ceramic Zero's streamlined beauty. From the front it looks something like the Samsung Galaxy S9, with an Infinity-style display and slim (but still very visible) top and bottom bezels. Flip it over, and you'll find a smooth, glass-like back with a centred camera, and a recessed flash where the fingerprint sensor should be.

Basically, the Meizu Zero and the Vivo Apex look just like every other premium phone out there until you get to the edges. In place of protruding power and volume buttons are haptic-enabled panels that rest flush against the sides. On the bottom, you won't

NEWS

Meizu is supplying a wireless charger in the Zero box

find any of the familiar Android ports, leaving a smooth edge and lots of questions.

A losing battle

The Meizu Zero might look as clean and minimal as can be, but at first glance there's nothing about it that's any more striking than the Essential Phone, iPhone XS, or really any other premium phone. It's not even the first phone to dump the fingerprint sensor.

So what are we gaining by losing the ports? If you care about a unibody design, I suppose that's something, but it's not like the seams are upsetting the looks of the OnePlus 6T or Galaxy Note 9. Elsewhere, the Zero obviously has wireless charging and Bluetooth, so that covers the USB-C port. (The

Apex uses a proprietary magnetic connector called MagPort.) In place of the fingerprint reader, they both have optical in-display fingerprint sensor. As for sound, Meizu is promoting its mSound 2.0 technology that plays audio through the screen instead of a speaker.

But even if the Zero's unique sound system is as good as a regular speaker, the in-display fingerprint sensors are as fast and reliable as a hardware one, and Super mCharge delivers on its promise of 18W wireless charging – all big ifs – what's the point of removing every port? Smartphone design may be heading in that direction someday, but we're hardly ready for it now. Is anyone really complaining that the bottom of their phone has too much convenience? The 'innovations' in the Zero and the Apex are little more than replacements for established and arguably better technology, and I don't see anything in the way of improvements.

You can argue the merits, but when Apple ditched the headphone jack it was for the sake of thinness and haptic engineering. At 7.8mm, the Zero is actually thicker then the 7.1mm iPhone 7, so it's hard to argue that it couldn't fit a USB-C port or speaker. The IP68 water resistance is nice, but no better than that of its hole-filled peers such as the Galaxy S9 and Pixel 3.

The Zero isn't even truly "holeless", as Meizu claims. On the top edge you'll find a pair of holes: one for a microphone, and another for a reset button that you'll need a paperclip or SIM eject tool to press. Ask any Android user, and they'll tell you they need to reboot their phone at least once a month and at least occasionally hard reset. Assuming the soft

reset method relies on the touch keys, you'll still want to remember a pointy object whenever you leave the house with your Zero. That's needlessly removing convenience.

Nothing to see here

To most buyers, the things Meizu and Vivo have removed to craft their 'unibody' designs won't be worth the headaches. I can think of several reasons why someone shouldn't buy one, chiefly the difficulty of charging it when you're on the road. But there are also the questions of a case, what with the touch-sensitive sides; the ease of switching carriers using eSIM; and the convenience of the in-display fingerprint sensor when it comes to anything other than unlocking. Don't get me started on the USB-C port.

To go full wireless and cordless, we're going to need technology that isn't available yet. Our phones will need to charge without wired pads. Secure facial scanning will need to be standard. And Bluetooth earbuds will need to do more than stream music.

Meizu might be able to claim the title of world's first 'holeless' phone by mere hours, but I'm not buying into the hype. The new handsets might make for good marketing copy and pretty renders, but when you break it down, we don't need to know how much it's going to cost to figure out its worth. It's right there in the name.

Google pays $40m for Fossil's smartwatch tech

But that doesn't necessarily mean that a Pixel Watch is coming, writes MICHAEL SIMON

The battle over your wrist just got a lot more interesting. In January, Fossil announced that it was selling $40 million worth of its smartwatch technology to Google, giving the Wear OS purveyor a serious stake in the wearable hardware game.

The deal may be a relatively small sum compared to the billions Google spent on Nest, but it could be

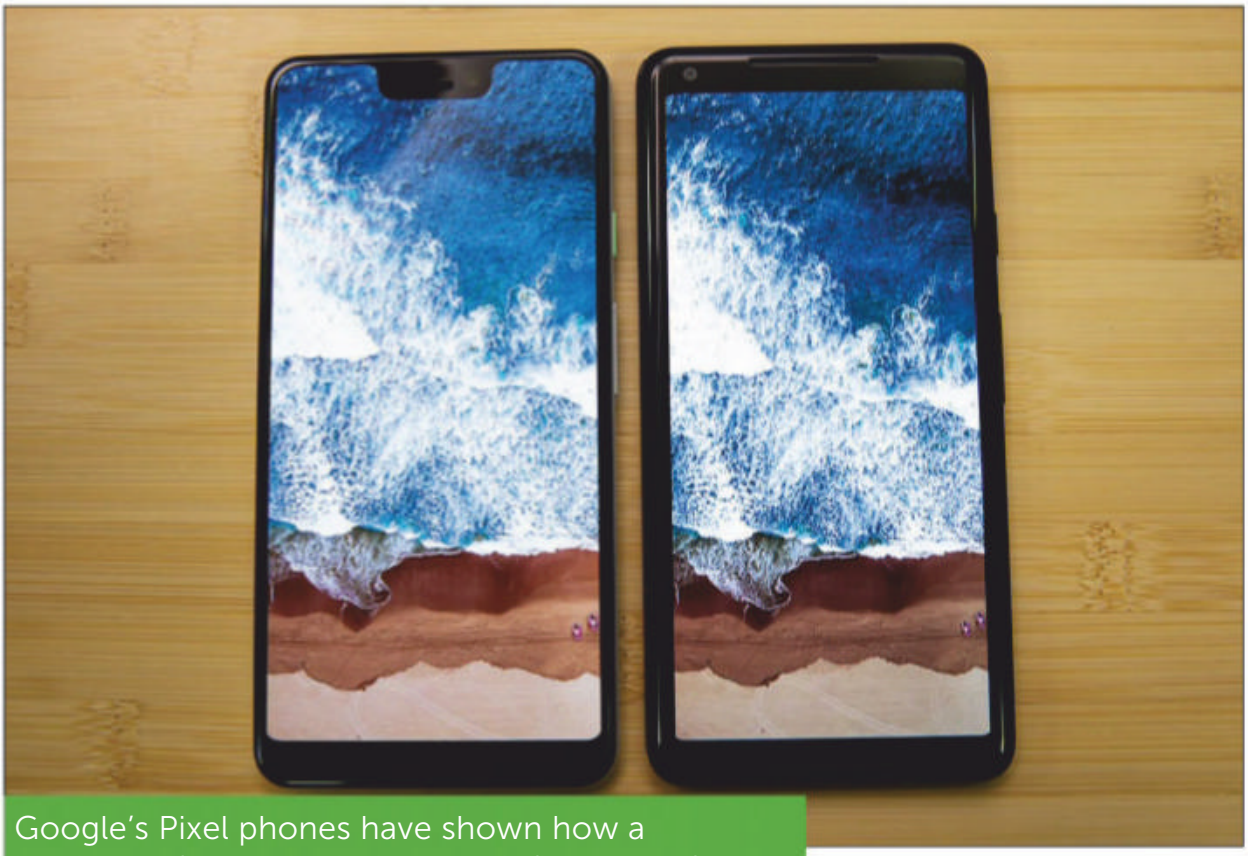
just as important. For one, Fossil is one of the only companies consistently turning out new Wear OS watches that people actually want to buy. But even if this deal doesn't result in a Pixel watch or Google-branded hardware at all, for the first time Google will have a wearable hardware team under its roof to help drive future design, navigation, and UI decisions.

And most importantly, it means that Google is committed to developing Wear OS into more than a one-size-fits-all platform that refuses to adapt to the hardware around it. And it could mean the first legitimate Apple Watch competitor is on the horizon.

Hardware impacting software

The last time Google announced such a sizable investment in someone else's hardware was when it went all-in on the Pixel phone. In January 2018, the firm spent more than a billion dollars to secure a large portion of HTC's smartphone design team, including thousands of engineers and a healthy chunk of intellectual property. While it's likely that the impact of Google's actual investment won't be fully realized until the Pixel 4 later this year, you can see how HTC's hardware team has already influenced the handset.

The Fossil partnership, while a pittance compared to the HTC deal, could have just as large an impact. On the Pixel phone, features such as Active Edge (a direct copy of Edge Sense on HTC's U11 and U12 phones), and the addition of wireless charging and a second front camera have been clearly steered by HTC's team, but the relationship goes much deeper than superficial hardware enhancements. More than



Google's Pixel phones have shown how a hardware-focused mindset can influence software

any other Android phone, the Pixel is filled with details that marry the hardware and software in a way that creates a seamless, congruous experience that showcases Android's best qualities.

You can see it in the new gesture navigation, the Pixel launcher, AI enhancements, and, of course, the camera. Over the past few revisions, Google has designed Android with the Pixel in mind. But those interface improvements and features that have resulted in a new level of integration for Google's operating system isn't just limited to the company's own phones. And that's the hope for Wear OS now that Google has an in-house

hardware team: a symbiosis the likes of which we haven't seen from non-Apple watch.

Fashion over function

When Android Wear launched in March 2014, there was no Apple Watch. The Galaxy Gear and Samsung's Tizen OS was still in its infancy, and the Pebble platform was little more than a glorified pager. Android Wear was the first wrist-sized OS that attempted to strike a balance between mechanical timepieces and data-delivering smartwatches.

What made the first few Android Wear watches (namely the Moto 360 and the Huawei Watch) so promising was their tight relationship with Android Wear. From the classic faces to the single-button

Google hasn't done much to set Wear OS apart from its competitors

navigation, the earliest Android Wear watches were natural extensions of their smartphone counterparts, and they represented a stark difference from the bland, uninspired designs from Samsung and LG. They looked good, they worked well, and they redefined our expectations.

When Apple Watch was unveiled some six months later, it only solidified Google's vision. Where Apple's timepiece was a piece of tech that happened to tell time, the Android Wear watches were far more traditional in both appearance and functionality, with a focus on dials and glances rather than advanced functionality. It's why Fossil's smartwatches have been able to thrive while the models made by smartphone OEMs haven't: Android Wear/Wear OS watches appeal to people who want a smarter watch, not necessarily a smartwatch. Google could have bought any smartwatch team, but it chose Fossil for a simple reason: Google doesn't want to fill Wear OS with apps and features no one uses. It wants Wear OS to be as simple and interaction-less as possible.

One size fits one

You've probably seen one of Fossil's Wear OS watches in the wild without even realizing it. For one, they look like old-fashioned wristwatches from a distance, but what's more is that they follow the design language of the brands they're representing: Michael Kors, Kate Spade, Armani, Diesel, and, of course, Fossil itself. Some are hybrids with mechanical arms and tiny screens, others are full smartwatches with always-on displays and endless customization.

NEWS

Fossil's wearables, such as the Michael Kors Sofie watch, put form before function

What they all have in common, however, is that the smarts are mostly focused around the important feature of any watch: the face. Many Fossil watches eschew common features such as heart-rate sensors and NFC chips in favour of designs that are both familiar and fashionable. While there are plenty of Wear OS watches that try to cram as many sensors as possible into bigger and bigger frames, Fossil is less interested in do-it-all devices than it is in exploring the simpler watch aspects of the smartwatch. And Google could use that strategy to tighten and focus Wear OS in the key areas that matter: fitness, health, and, most of all, timekeeping.

By investing in Fossil, Google isn't trying to replicate the Apple Watch's success. Rather, it's recognizing that smartwatches don't need to be a sprint to the top of

the features heap. There are plenty of people that are interested in smartwatches for simple functionality and smart integration rather than a pile of features, and that's where Fossil can help. Google has already indicated that it's more interested in developing Wear OS to work better with its partner brands than developing it's own hardware, and a move away from the idea of a 'one-size-fits-all watch'. The Fossil partnership solidifies that line of thinking and gives Wear OS a potential and future it hasn't had in years.

With Fossil as a guide, the next phase of Wear OS should be less about taps and apps, and more about building a simpler software experience that requires less interaction. As it stands, Android Wear and Wear OS has always been an interface in search of the right hardware. The hope now is that Google can deliver a fully realized platform that can scale on demand and doesn't try to be anything more than it has to be: a wearable people actually want to wear.

HANDS-ON

Royale FlexPai

Price: £1,209 inc VAT
Release date: Available now from **fave.co/2R3pZVO**

While the phone industry wrestles with notches, pinhole cameras, and full-screen displays, there's another massive smartphone revolution waiting in the wings: flexible displays. Royole is one of the companies that's developed the flexible screen tech itself, but is making its proper smartphone debut with its own device, the FlexPai. We tracked it down at CES 2019 to give it a bend ourselves and see what it's like.

Design

So yeah, the Royale FlexPai folds. The full screen is a 7.8in AMOLED, essentially making this a proper tablet, but it's made out of a flexible plastic that means you

can fold it over to get something closer to the average smartphone size – albeit one with a display that then wraps round to the back.

It is undeniably cool, and it's a bit mad to think of the tech that's gone into it. But it's certainly not without downsides. For one, the plastic screen feels cheaper than the glass you'll be used to from other devices, especially in the bit that folds – when expanded to tablet size you can basically feel the slack in the screen that it needs to be able to fold.

Perhaps more worryingly, the sample we got to play around with was showing signs of screen burn-in, with app icons still visible against the white background of the settings app. It's hard to say for sure if you can expect the same problem in the release models, but it's hard not to worry that this is a sign that the FlexPai has been rushed to market a little, and that the tech might not quite be there yet.

The design also requires a squidgy rubber section on the back of the device where it folds, which is mostly hidden when folded, but is undeniably unsightly when you have it set up as a tablet. We also found that when folded out the screen actually doesn't quite go perfectly straight again – there was always a slight bend to the body, which detracts even further from the feel.

There's a very satisfying click when the phone folds into place though, thanks to some sturdy magnets that serve to hold the screen in place. You don't have to fold it all the way though, and you can fold it part of the way to then prop the phone up in landscape mode for watching videos or doing work.

HANDS-ON

The software is unsurprisingly a bit janky right now, too. The FlexPai runs Android 9 with Royole's Water OS on top, and in our time with the phone it lagged and glitched every time we folded the phone, with the camera app in particular struggling.

Still, notches were a bit awkward at first too, and it's certainly likely that Royole will be working hard to correct the bugs. There are some nice touches in there too, like the chance to use the folded over edge of the display for some custom shortcuts for various apps – details that suggest there could be real usability benefits to phones with this sort of design.

The foldable design also neatly gets around the constant question of where to put the selfie cameras – the FlexPai puts its dual lens camera on what would

There's a satisfying click when the phone folds into place thanks to some sturdy magnets that hold the screen in place

be the rear of the device when folded – in a large bezel that essentially serves as a grip – and you can just flip the phone round when you want to take a selfie or a video call.

Performance

All of that fancy folding wouldn't count for much if the FlexPai couldn't cope as a phone though, and luckily Royole has gone all-out to help justify that extravagant price. For one, it's one of the first phones to be announced with the Snapdragon 855 processor, so it should be a nippy little thing once the software kinks are worked out. That chip is backed up by either 6- or 8GB or RAM, along with 128- or 256GB of storage, expandable via microSD.

Royole isn't ready to make firm promises about battery life yet, which is a bit of a question mark for us. The 3,970mAh capacity would normally get you close to two days in any other phone, but we can't help but suspect that the big display here is going to drain power fast, so it may not last as long as you're used to.

Beyond that there's USB-C charging, and the usual array of Bluetooth and Wi-Fi for connectivity, though sadly even at this size Royole decided to drop the headphone jack.

Verdict

'Fun but flawed' is really the only sensible reaction to the FlexPai right now. The foldable display tech is genuinely impressive, but you can't escape the feeling that it's not quite there yet. Laggy software, a plasticky finish, and worrying evidence of screen

burn mean that right now the FlexPai feels like a sign of where phones are going, but proof that they're not there just yet. We're still holding out more hope for Samsung's effort, which we should see very soon. **Dominic Preston**

Specifications

- 7.8in (1,920x1,440) 308ppi) flexible AMOLED touchscreen)
- Android 9.0 Oreo with Water OS 1
- Snapdragon 855 octa-core processor
- 6/8GB RAM
- 128/256GB storage
- Dual lens rear camera: 16- and 20Mp
- Wi-Fi
- Bluetooth
- 4G LTE
- Dual nano-SIM
- USB-C
- 3,970mAh non-removable battery
- 190.3x134x7.6mm
- 320g

Lenovo Smart Tabs

Price: From $199 (around £150)
Release date: To be confirmed

As Google and Amazon began to introduce smart displays to the market, pretty much the first question anyone asked was: why not just use a tablet? It seems that Lenovo at least has taken the criticism to heart, using CES 2019 to unveil its two new Smart Tabs: Android tablets that offer Alexa support and are sold together with a speaker dock.

Designed to offer the simplicity of the Echo Show or Google Home Hub – or Lenovo's own Smart Display – while pairing it with the convenience and portability of a tablet, this seems like an obvious win,

though it faces obvious competition in Amazon's Fire tablets, which come with the option of a charging dock that accomplishes the same thing.

Design

The easiest way to think of the Smart Tabs is that it's actually a bundle of two products: a 10in Android tablet together with a charging dock and speaker.

The tablets themselves are unremarkable from a design perspective: they're pretty typical black Android tablets, with 10in LCD screens, USB-C, and a headphone jack. There are bezels – not too thick, not too thin – and both front and rear cameras, along with a microSD slot to expand your storage.

The obvious visual difference is that the M10 has a metal rear, while the pricier P10 has a glass back – a little bit flashier, but equally slightly more vulnerable to damage. The P10 is also a bit lighter – 440g versus

The Smart Tabs is two products: a 10in Android tablet together with a charging dock and speaker

480g – despite having a larger battery, so the glass is clearly helping to keep the weight down.

The P10 also boasts four front-facing speakers, while the M10 only has two, but these are unlikely to matter too much, as any time you want to watch video or listen to audio you'll probably be doing it through the dock. That at least is identical no matter which model you buy. This squat dock has a speaker that wraps all the way around, so you can position it however you'd like from an audio perspective, though since the screen can only face one way, that's really going to dictate things.

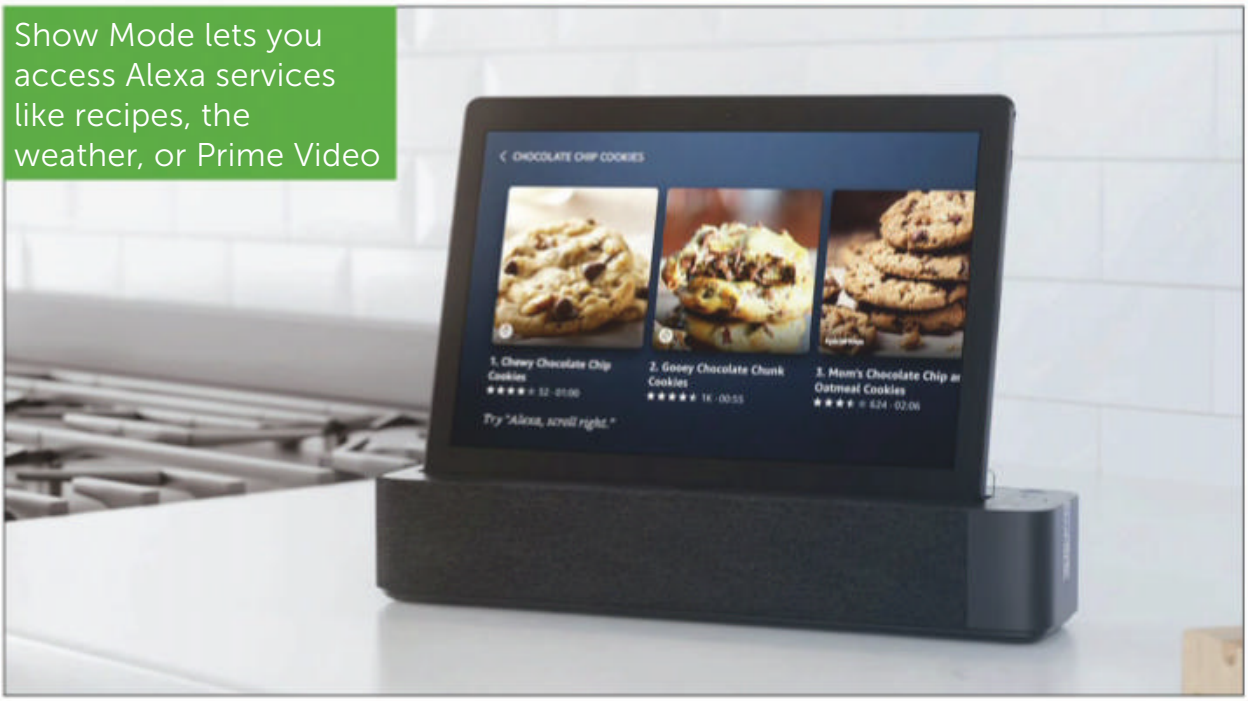
There are a few simple buttons – Bluetooth, volume, and a mic mute – and a little plastic stand at the back to keep it stable with the tablet in, but otherwise the dock is, much like the tablet, simple and functional. It's not going to win any design awards, but it's a clean, modern design that should fit into most homes.

Performance

So what do you get from the dock? The tablet attaches using simple pogo pins, which charge it while it's in the dock, but all the actual data transfer is handled via Bluetooth 4.2.

Slot it in and the device recognizes that it is connected and switches into Show Mode – the same software mode that allows Amazon Fire tablets to double as Echo Show devices too. This gives you a simplified view that lets you access Alexa services such as recipes, the weather, or Prime Video, without fighting through the whole of Android.

HANDS-ON


CHOCOLATE CHIP COOKIES
1. Chewy Chocolate Chip Cookies
2. Gooey Chocolate Chunk Cookies
3. Mom's Chocolate Chip Oatmeal Cookies
Try "Alexa, scroll right."

Show Mode lets you access Alexa services like recipes, the weather, or Prime Video

While docked, this is essentially an Echo Show then, devoting the screen to all things Alexa. And yes, it's Alexa, not Google Assistant, despite the fact that this runs Android, and that Lenovo partnered with Google on its previous Smart Display.

There are some advantages to the setup here for though. The big one is YouTube – Amazon and Google's ongoing feud has seen Echo devices locked out of the video platform, but you can still access the regular YouTube app here. You can't use Alexa voice commands to play videos for you, but at least you can watch videos as you would on any other tablet – though we're not sure yet if there's a way to do so while the device is docked.

Since the dock also packs a speaker, sound quality is solid, too. Bass is naturally limited, but it's punchy, and loud enough for filling a kitchen while you cook

– though naturally if you have a bigger home speaker system around you might prefer to run the sound through that.

So this is a pretty good smart display for the most part, but it's a bit more average as a tablet. RAM ranging from 2- to 4GB is low – though not entirely unreasonably for the price – while the 1.8GHz Snapdragon 450 processor is fine, but not fast. It's even shipping with Android O, rather than the more recent P.

Battery life will vary greatly between the models, as the M10 packs a 4,850mAh capacity, while the P10 jumps to 7,000mAh. Lenovo suggests 15- to 20 hours of battery for each, but we're a little sceptical, though if you plan to mostly use the device docked, this will be far less of a concern anyway.

Cameras vary, too. Both devices feature front and rear cameras, but they're 2Mp/5Mp on the cheaper model, and 5Mp/8Mp on the premium model. If you're planning on using it for video calls, that's another good reason to jump up to the P10, which should produce much crisper footage.

Verdict

These are ultimately budget tablets – especially when you consider the included cost of the dock. Lightweight specs and a simple feature set make sure these tablets would never stand out if it weren't for the included dock. The problem is simply that Lenovo didn't get here first. Amazon did with its Fire tablets, and with the added bonus that you can buy extra Show Mode Docks for different rooms – versatility

HANDS-ON

Lenovo's Smart Tabs look great

that Lenovo simply doesn't offer – not to mention the option of saving money by opting for an 8in model.

The reasons to opt for the Lenovo edition are if you know you want full access to Android and YouTube – rather than Amazon's stripped back FireOS – or if you know you'll make use of the dock's built-in speaker, rather than simply connecting it up to another sound system anyway. If those are worth paying a little extra for the hardware and limiting yourself to one dock, then go ahead. If not, stick to a Fire tablet – or just a plain old smart display. **Dominic Preston**

Specifications

Smart Display

- 10.1in Full-HD (1920 x 1200) LCD touch display
- Android 8
- Qualcomm Snapdragon 450 processor
- 2GB, 3GB, 4GB RAM

- 16GB, 32GB, 64GB storage
- USB-C 3.1
- 3.5mm headphone jack
- Fingerprint reader (P10 only)
- 8Mp (P10) or 5Mp (M10) rear camera
- 5Mp (P10) or 2Mp (M10) front camera
- Four (P10) or two (M10) speakers with Dolby Atmos
- Bluetooth 4.2
- 7,000mAh (P10) or 4,850mAh (M10) battery
- 242x167x7mm (P10) or 242x167x8.1mm (M10)
- 440g (P10) or 480g (M10)

Smart Dock

- Dual 3W speakers
- 13x far-field microphone
- 150x283.6x65.5mm
- 1.52kg

REVIEW

Honor View 20

Price: £499 inc VAT from **fave.co/2Rm3ED0** ★★★★½

Honor is no stranger to flashy designs – bright blue, glass-backed phones have become the company's signature look – but thanks to a punch-hole camera and a unique 'nanolithographic' rear, the View 20 is a seriously striking device even by Honor's standards. Although the phone was released in China in December 2018, Honor showed the View 20 off to western media at CES, and it's now available in Europe, too.

Design

In all honesty, most of the things that make the View 20 unique come down to its design, rather than its

specs, with both the front and rear of the device exciting in their own ways.

For the front, you get a punch-hole/pinhole/in-screen camera (take your pick, no-one seems to have decided what to call these yet). The View 20 wasn't the first phone to be announced with the notch replacement – Samsung got there first with the A8s – but the View 20 is coming out in Europe first, and Honor has been at pains to point out that its camera is a whole 1.5mm smaller, so there's that.

This notch-alternative gives you a close-to full-screen 6.4in display, but in practice it takes up the same amount of screen real estate as the teardrop notches in the likes of the OnePlus 6T, only shifted over to one side and separated slightly from the bezels. Your mileage will vary on whether it's more or less distracting than a notch, but it's undeniably striking. If you really hate it, you can always switch it off on the software side and leave a black bar across the top of the display.

And so is the rear of the phone. Honor's past few flagships have all played around with interesting reflections and refractions, and the View 20 takes this to a whole new level with a nanolithographic design that boasts a subtle V-shape running down the whole back of the phone, without adding any texture to the smooth glass rear.

Shift and move the phone around and it catches the light in all sorts of shades and highlights, especially if you opt for one of the coloured versions of the phone. Our review unit is the Phantom Blue version of the phone, but you can also get it in

REVIEW

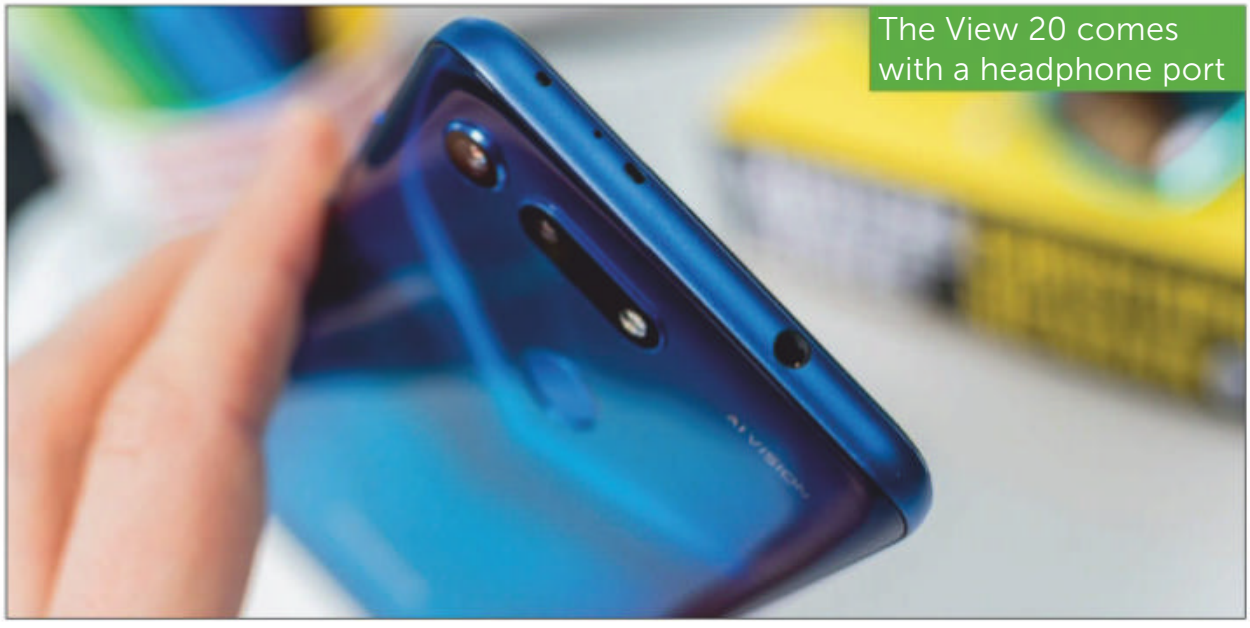
Phantom Red (sadly unavailable in the UK), or Midnight Black and the slightly darker Sapphire Blue – though it's worth remembering that the Phantom versions of the phone come with slightly higher specs.

There's a fingerprint sensor on the rear – no in-screen fingerprint tech here, even though Honor included it in the Magic 2 – and the USB-C port supports USB 3.1 for faster data transfer, though the included cable is only USB 2.0. Waterproofing is still absent, as is any form of wireless charging.

Still, little touches such as texturing on the power button to distinguish it from the nearby volume rocker, or the subtle curve to the rear edges, add up to make this feel more polished than any Honor device so far.

Basically, this phone looks lush. Honor phones are almost always visually exciting, but the View 20 might just be their prettiest yet, and this is an early contender for 2019's best designed device.

Oh, and you get a headphone jack.

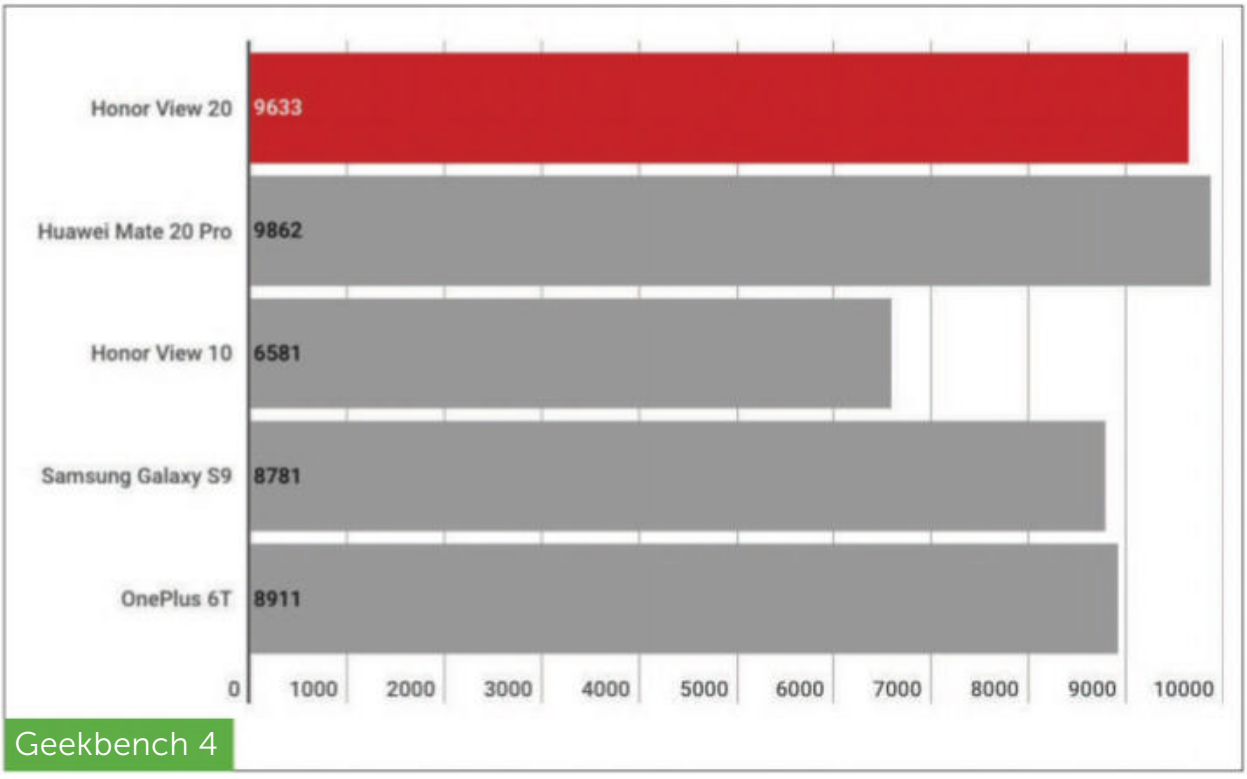


The View 20 comes with a headphone port

Performance

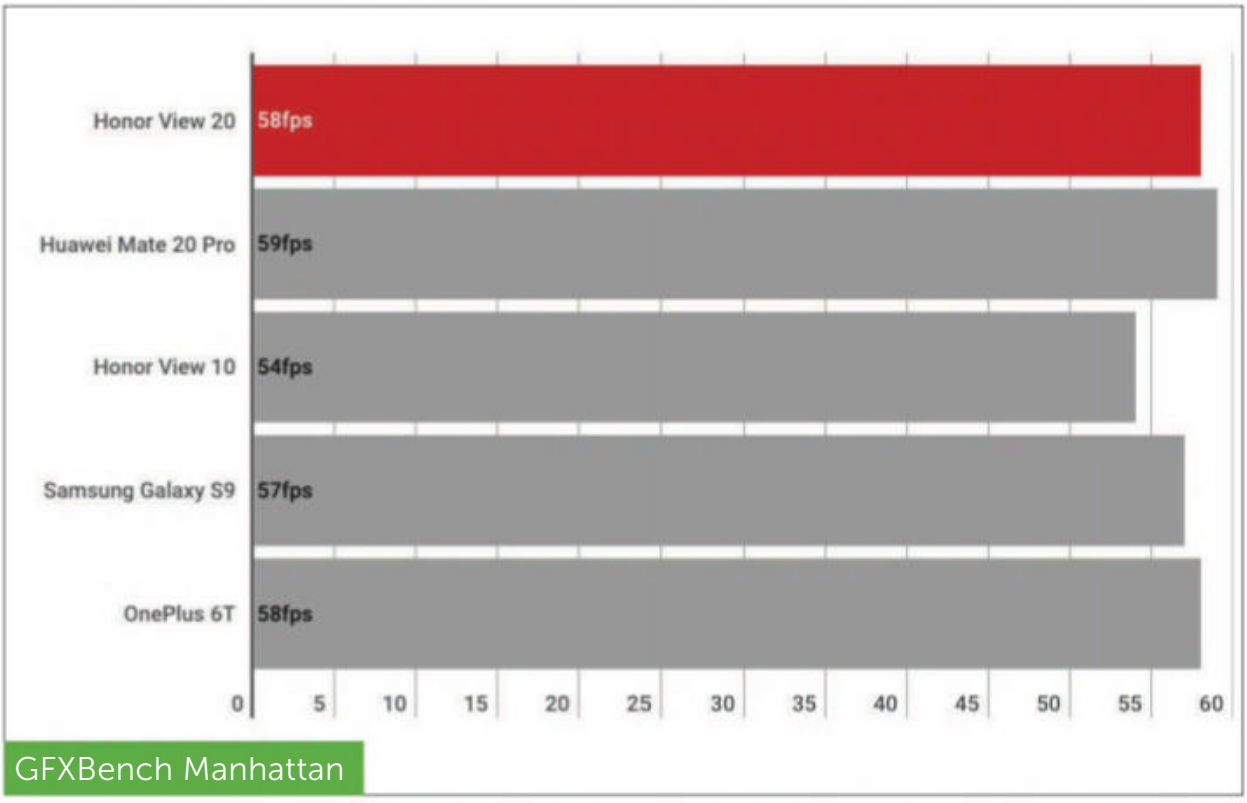
Still, looks alone do not a flagship make. Luckily, the View 20 is no slouch when it comes to specs. Inside you'll find Huawei's flagship Kirin 980 processor (the same chip as the Mate 20 and Mate 20 Pro), which means this phone breezes through day-to-day tasks and can handle just about any high-end mobile game too.

RAM and storage depend slightly on the model you opt for. The regular View 20 comes with 6GB RAM and 128GB storage, while opting for the Phantom versions gets you 8GB and 256GB storage. That means that if you want the higher specs you'll have to get the phone in blue (or red if you're in a country with that version), and if you want to save money you're limited to black and blue.

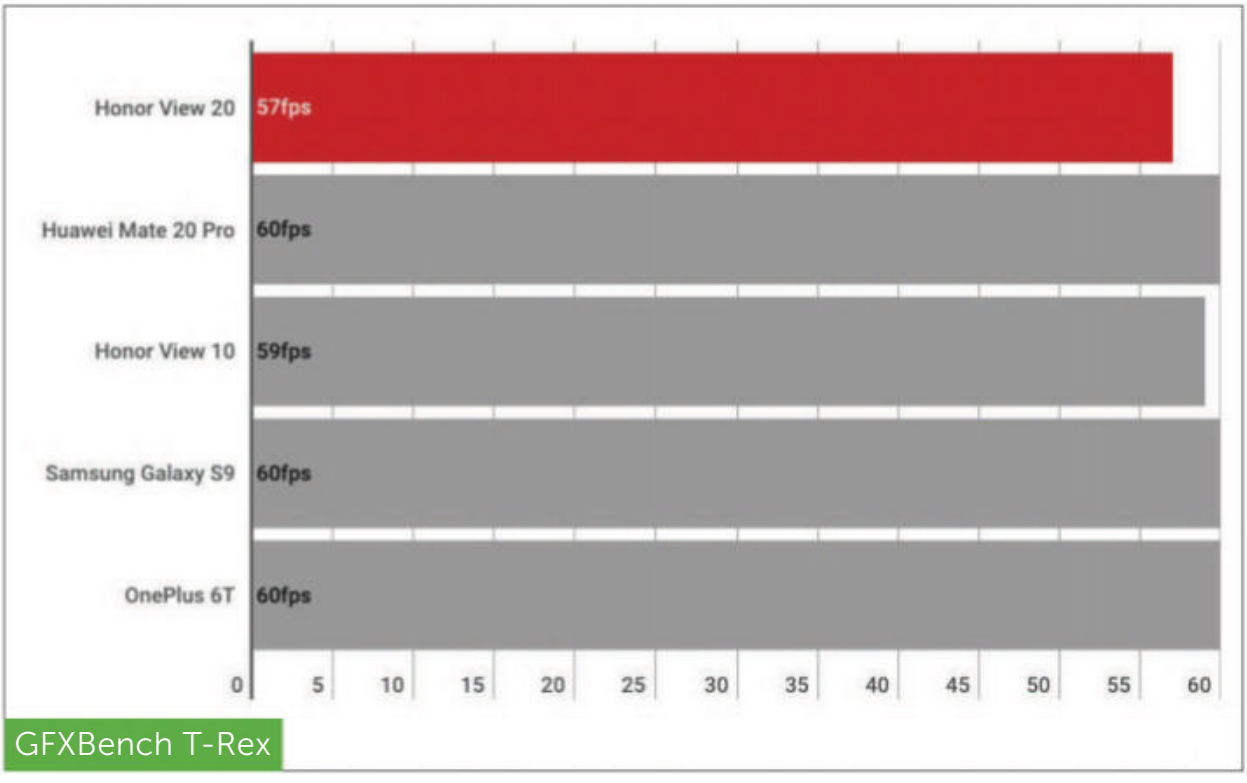


Geekbench 4

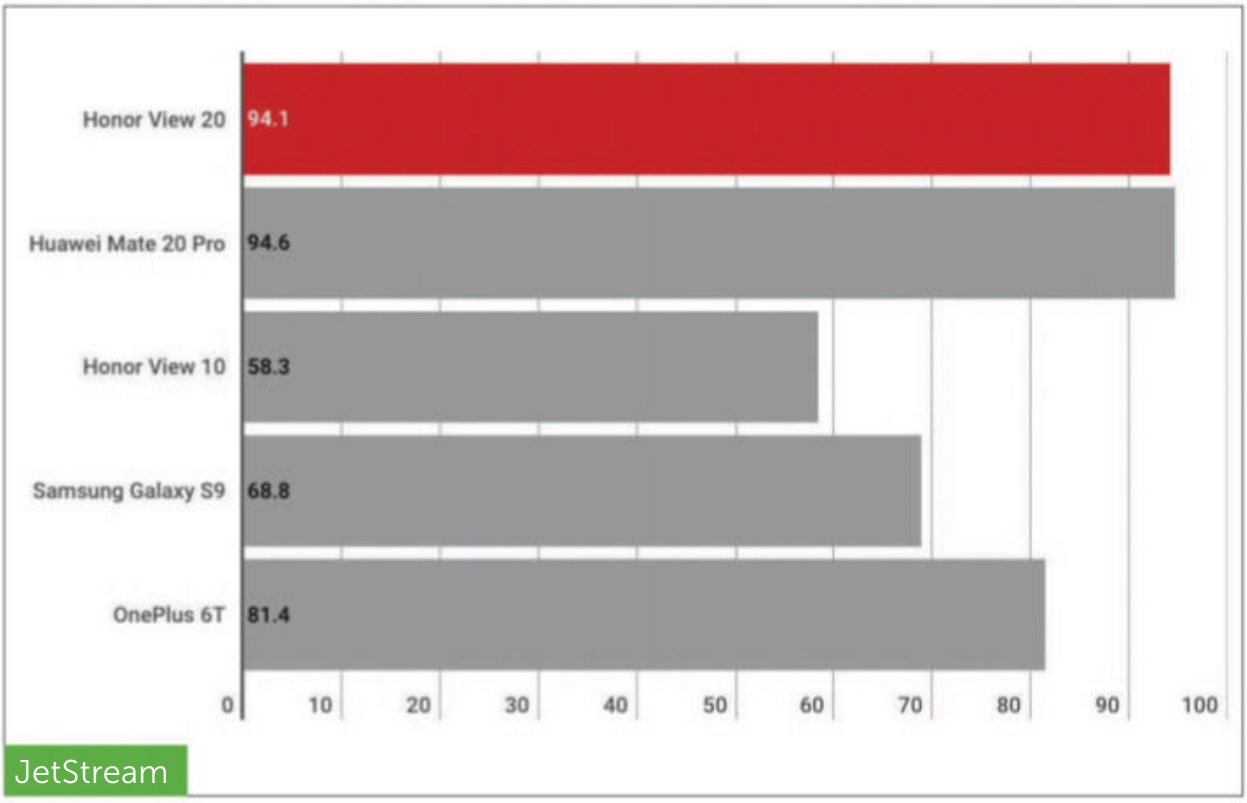
REVIEW



GFXBench Manhattan



GFXBench T-Rex



In our benchmarking the View 20 scored almost identically to the Mate 20 Pro across the board – unsurprising given the internals – and happily trounced last year's View 10. Up against leading rivals like the Samsung Galaxy S9 and OnePlus 6T the View 20 still holds its own, especially on the Geekbench CPU test and the JetStream browser benchmark – arguably the two with the greatest relevance for ordinary day-to-day usage. Remember that these benchmarks are with the 8GB RAM version of the phone, so performance might be slightly reduced on the 6GB version.

The screen is a 6.4in, 2,310x1,080 panel with a very respectable pixel density of 398ppi. The max screen brightness of 365cd/m^2 is a little lower than we're

used to seeing from flagships, but realistically it's rare that you'll need to run it up to max anyway. It's all fine, but from a hardware perspective this is definitely the phone's weak link – it's not bad, but it's not up with there with the big OLED flagships.

As for battery life, you're looking at 4,000mAh, which means this should last most people a couple days of usage. At the time of writing, I've been using the phone for two days and two hours and it's somehow still sitting on 42 per cent. It's not been the most intense weekend of phone usage, but even so I feel confident in saying the battery life should be more than enough for most of you.

The View 20 also includes Honor's 'supercharging', though note that it's just 22W – not the 45W supercharging of the recent Honor Magic 2. Honor says the phone will charge to 55 per cent in 30 minutes, and in our testing it actually managed to hit 59 per cent in that time – not quite the fastest out then (that goes to the Oppo RX17 Pro) but undeniably nippy. As already noted, there's no wireless charging here, so it's wires only we're afraid.

As for software, all of this is running on Android Pie 9.0, with Honor's Magic UI 2 on top – the company's slightly tweaked version of Huawei's EMUI. It's a little clunky at times, but gives users a decent amount of freedom without sacrificing ease of use, and plenty of users prefer it to the stock Android experience.

Cameras

Those internal specs are impressive, but what Honor really wants to push is the View 20's camera setup

– on both sides of the phone. Let's take the front first again. That in-screen camera is packing 25Mp of horsepower, so it's no slouch, and from using it a bit there's no evidence that sitting underneath the screen has compromised photo quality at all. I'd hardly consider myself a passionate selfie taker, but it certainly seems to me that anyone who is would be happy with what the View 20 has to offer – obligatory portrait lighting and beauty effects included.

The rear cameras are arguably more interesting, punch-hole aside. The twin sensors are each interesting in their own right: one is the first 48Mp sensor anyone has ever bothered to put into a phone camera, while the second is a 3D camera which the phone uses for depth sensing.

At this point, it's worth reiterating that megapixels aren't everything, and this is a case where more

The twin sensors on the rear include a massive 48Mp camera

REVIEW

definitely doesn't always equal better – and in fact there can be some disadvantages to super-high pixel counts. Still, under the right conditions this 48Mp sensor should produce some seriously crisp shots, especially with the help of the Kirin 980's AI image processing in the dedicated Ultra Clarity and Night modes.

In our test shots you can see that landscape and macro shot (see overleaf) alike have come out with superb detail and colour reproduction, while even our low light test shot (see overleaf) is impressively crisp – and that's without Honor's AI mode enabled, which adds extra colour adjustment and post-processing. It tends to make shots look more dramatic, but the effect can be a bit overblown.

Landscape shot

The Ultra Clarity mode here is more interesting. It takes multiple 48Mp shots over four seconds or so – meaning you'll need a steady hand and a still subject – and uses machine learning to combine them into one image. I'll admit to being a bit sceptical going in, but as our St. Pancras Renaissance Hotel test shots show just how much work the Ultra Clarity mode (see below) is doing.

The secondary 3D infrared lens is really more of a gimmick. It should help improve portrait mode, along with a few more niche use cases: artificially slimming you in photos; more accurate calorie counting through the camera by judging portion sizes; and motion-controlled gaming (à la Xbox Kinect, and probably about as well-supported). You

Ultra Clarity shot

REVIEW

Macro shot

can also make little AR characters that will mimic your movements – essentially a full-body version of Animoji.

There's not really much here to show that a 3D camera is any more than a novelty, and we can't imagine anyone rushing to buy the phone for it. It's also not accessible in the UK yet, with a software update promised to

Low light shot

unlock the functionality – but apparently not for two months or so after launch. But hey, it doesn't hurt, and the main lens is more than accomplished enough to make up for it anyway.

Verdict

The View 20 is stunning to look at – from just about any angle, thanks to the one-two punch of the pinhole camera on the front and the genuinely unique holographic V effect on the glass rear. The photos look great, but still don't really do this thing justice.

The specs are plenty powerful to match, and comfortably rival much more expensive flagship phones (including Huawei's own Mate 20 Pro). And perhaps for the first time, Honor deserves to be in the same conversation as the big names when it comes to camera quality. Touting a high megapixel count is meaningless, but it's hard to argue with the results, especially from the AI Ultra Clarity mode.

Honor's flagships have always offered serious specs and slick design while undercutting rivals on price, but it usually feels like there are a couple of compromises along the way. For perhaps the first time, the View 20 doesn't feel that way. Sure, premium features like wireless charging and waterproofing are still missing, but for most people those remain nice-to-haves – whereas with the core features here Honor is firing on all cylinders. **Dominic Preston**

Specifications

- 6.4in (2,310x1,080, 398ppi) IPS LCD capacitive touchscreen

REVIEW

- Android 9.0 (Pie)
- HiSilicon Kirin 980 (7nm) processor
- Octa-core (2x 2.6GHz Cortex-A76, 2x 1.92GHz Cortex-A76, 4x 1.8GHz Cortex-A55) CPU
- Mali-G76 MP10 GPU
- 6GB, 8GB RAM
- 128GB, 256GB storage
- Dual rear-facing cameras: 48Mp f/1.8, 1/2in, 0.8µm, PDAF; TOF 3D stereo camera
- 25Mp front-facing camera: f/2.0, 27mm
- Dual-band 802.11ac Wi-Fi
- Bluetooth 5.0
- A-GPS, GLONASS, BDS, GALILEO, QZSS
- NFC
- Fingerprint scanner (rear-mounted)
- USB 3.1, Type-C 1.0
- Non-removable 4,000mAh lithium-polymer battery
- 156.9x75.4x8.1mm
- 180g

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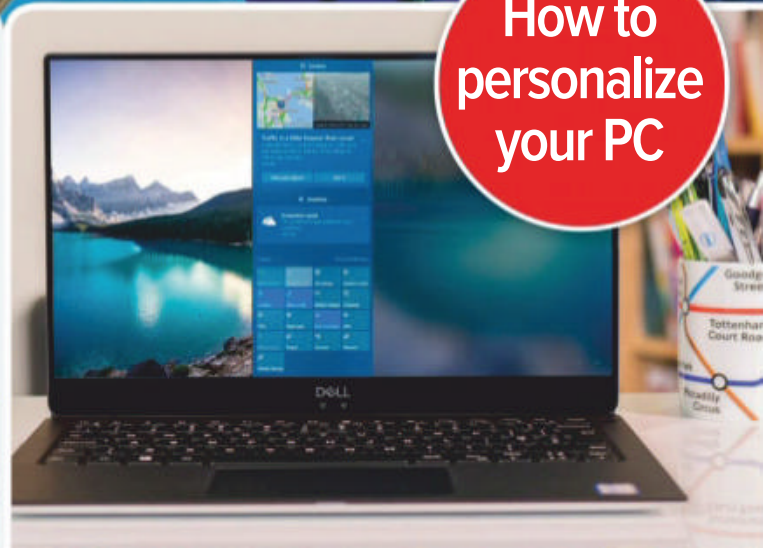
TECH ADVISOR

CES SPECIAL

BEST NEW PRODUCTS REVEALED

APRIL 2019 IDG

End of the road for Windows 7



How to personalize your PC

REVIEW

Mi Mix 3

Price: £499 inc VAT from **fave.co/2WfZsZi** ★★★★½

Following an October Chinese launch, the Mi Mix 3 is now officially available in the UK. It's all about the cameras and the display in the Mi Mix 3, which refines the already great Mi Mix 2S on two primary fronts. This new generation also includes a dedicated button for calling up either the Google Assistant or Mi AI client, depending on whether you buy the UK or Chinese model, and in early 2019 a fifth variant will be introduced making Mi Mix 3 one of the first 5G phones in the world.

This is the standard model, with 6GB of RAM and 128GB of non-expandable internal storage. In China an 8GB RAM model is also sold with either 128- or 256GB storage, and there's a limited edition Palace Museum Mi Mix 3 with a massive 10GB of RAM. All four are flagship-level smartphones, offering a mix of top-class performance and features.

Interestingly, no model in the Mi Mix 3 line has an in-display fingerprint sensor (instead found at the rear), which is one of the hottest new trends of this year, and something of a surprise for a phone that began life as Xiaomi's 'concept' phone, stealing column inches for its revolutionary design.

Whether its absence is evidence of a cost-cutting decision or the fact that implementing two new kinds of screen tech at once is tricky we're not entirely sure, but Mi Mix does remain the only Xiaomi phone family with wireless charging, and the Mix 3 is the first in the entire line-up with a magnetic sliding screen.

The design remains something special, once again a creation of Phillipe Starck, but the slider concept is not entirely new, having already been seen in the Honor Magic 2 and Lenovo Z5 Pro – but in those phones it doesn't achieve much, aside from moving the selfie cameras out the way to allow an uninterrupted full-screen view. With Mi Mix 3 you slide to start: it can automatically launch the selfie camera, or provide a bunch of quick-access functions such as a timer, recorder, calculator, notes app, camera and the weather. On the Chinese model there are mobile payment options here too, though they are Chinese only so unsurprisingly they are gone in the UK version.

REVIEW

For this review we tested both the Chinese ROM version of the Mi Mix 3, and the UK model that will go on sale here on 16 January. As we outline below you can save some money opting for the Chinese version, but as well as putting up with the preinstalled Chinese apps, Chinese Mi AI client and Chinese mobile payment services, you'll need to install Google services on the Chinese model (see **page 105**).

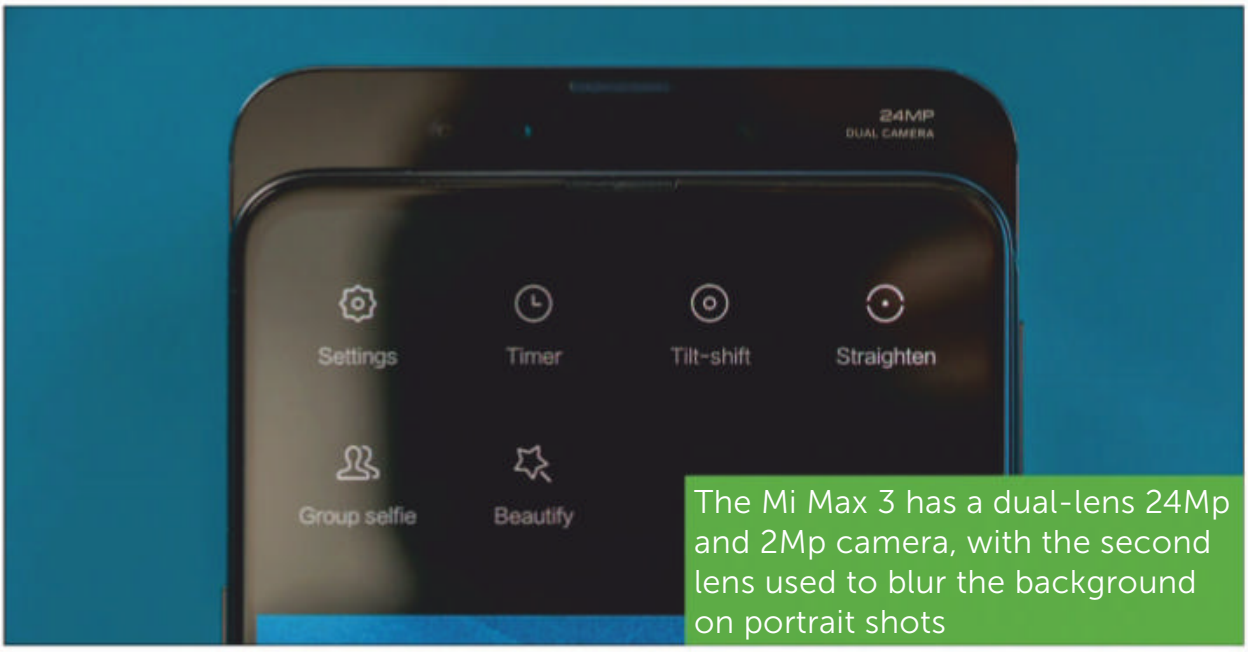
Design

The Mi Mix was the first phone to introduce the 'full-screen display', though in truth it never has been entirely bezel-less. The original model was all screen on three edges, but with a chunky chin at the bottom where you found the upside-down selfie camera. And gosh was that annoying.

Over the years the design has been refined, with this chin getting slimmer with each new generation, but only now in the Mi Mix 3 has the chin been removed altogether.

It's worth pointing out that there is still a tiny but very much present screen bezel running the entire circumference of the phone, but Mi Mix 3 achieves an astonishing screen-to-body ratio of 93.4 per cent. Though a 100 per cent screen-to-body ratio would look phenomenal, we would worry about its fragility.

Xiaomi has achieved this by implementing a sliding screen mechanism that uses neodymium magnets with a life expectancy of 300,000 cycles. Most phones are sold on two-year contracts, so using this as the benchmark you could slide open the screen 410 times a day without worrying about it breaking. That said,



The Mi Max 3 has a dual-lens 24Mp and 2Mp camera, with the second lens used to blur the background on portrait shots

without extensive use it's difficult to know how much dust and grime will find its way under the display.

There's also an Always-on Display option, showing the time, date and notifications, which should reduce the number of times you feel the need to wake the screen. And the speaker is actually built into the top bezel (though you'll need to squint to see it), which means you don't need to slide down the screen to hear your recipient at the other end as you do with the Honor Magic 2 and Lenovo Z5 Pro (though you can use it to answer a call).

The sliding action feels smooth, with the screen maintaining the same distance from the chassis and offering a satisfying click as it opens and closes. You can also choose from five different sounds that play as you slide open or shut the screen – Hi-tech, Warrior (our favourite), Mechanics, Intellect and Lighter – plus a few more available to download.

REVIEW

On the Lenovo and Honor alternatives the sliding screen is of little use other than hiding away the selfie camera(s) and other blemishes that would usually adorn the front panel of a phone. But on the Xiaomi, sliding open the screen can launch the front camera, or if you're not a selfie fiend you can set it to offer other quick-access options such as the weather, a note-taking app, a timer, a voice recorder, the camera, torch, a QR code scanner or a calculator (mobile payments, too, if you've bought the Chinese version). Thought it's not immediately obvious how you might go about accessing the home screen from here, touching any blank area of the screen achieves this.

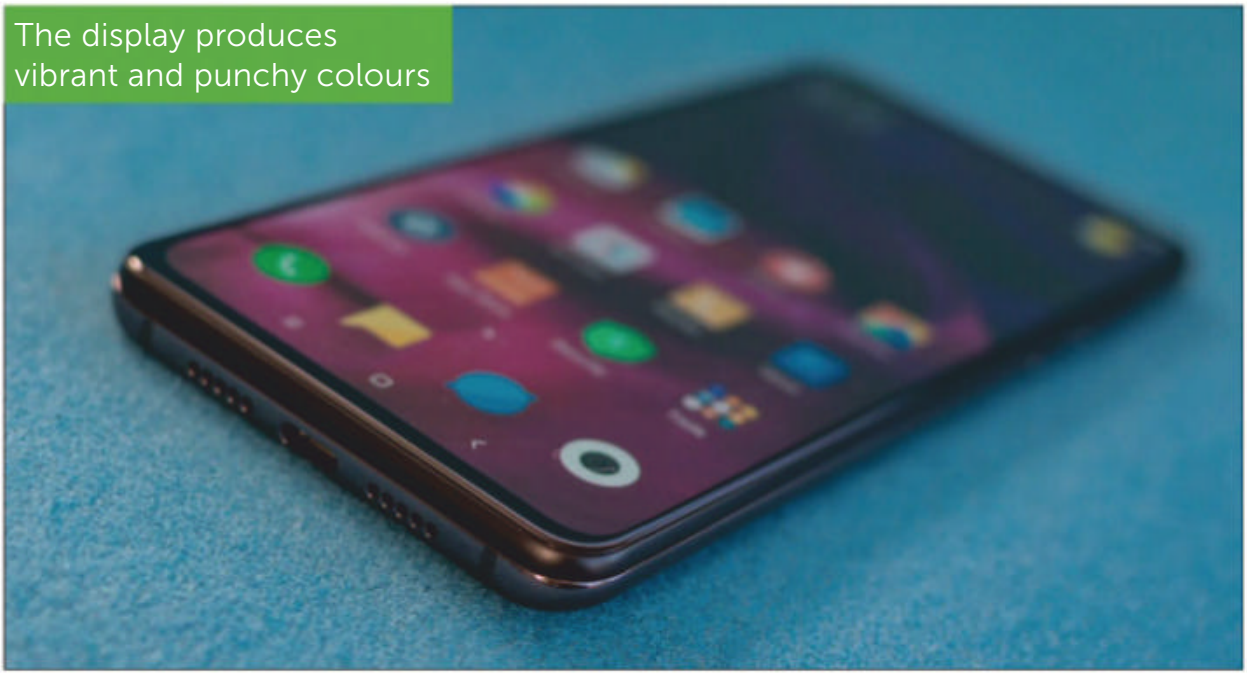
Whereas it might feel a little like a gimmick on those other phones, here the sliding screen not only adds functionality but allows for a big improvement on existing functionality. If you've ever used a Mi Mix phone before then you'll know that putting the selfie camera below the screen just does not work: the angles at which you need to hold the phone in order to capture a selfie where you look anything other than deranged are difficult to achieve, and the filters in apps such as Snapchat just don't play well with the format.

Now the selfie camera is not only in the correct position, but it's better than ever – up from a single-lens 5Mp camera to a dual-lens 24Mp and 2Mp model, with the second lens used to blur the background on portrait shots, plus there's an LED flash. The quality is significantly better, and the software integrates Xiaomi's AI, able to intelligently select the scene.

Removing the camera from the chin of the phone also means you no longer need the chin, so Xiaomi

has reduced the bezels and increased the size of the screen – from 5.99- to 6.39in. Given that it has a larger panel and a new sliding screen mechanism it's incredible that the Mi Mix 3 is fractionally shorter and narrower than the Mi Mix 2S, and only 0.4mm thicker. The battery capacity has been reduced by 200mAh, of course. This all helps toward making it feel more comfortable to use in a single hand, too.

The display itself has a taller aspect ratio than previously, now at 19.5:9 (previously 18:9). There's no notch, like you see on the Mi 8 family, so it's pretty much pure screen. Thankfully it's a nice screen, and this is an AMOLED panel which is our favourite kind of screen tech, bursting with vibrant, punchy colours and offering brilliant whites and deep blacks. It supports Xiaomi's Sunlight Display and Reading Mode, and indeed is easily bright enough for use in direct sunlight – we measured 407cd/m^2 in our tests,



The display produces vibrant and punchy colours

REVIEW

which falls a little short of Xiaomi's claimed 600cd/m^2, but is still very good.

The resolution is Full-HD+, which might sound less impressive than on other flagships. It's true that there is a visible difference with Quad-HD and Ultra-HD, but these things cost money and eat the battery – Samsung is now offering Quad-HD as an option but defaulting to Full-HD in its flagships, for example. Xiaomi has never added anything higher than Full-HD to any of its phones, and we're not sure it ever will – this resolution is perfectly adequate for clear text and images, and for enjoying games and media (graphics run faster at lower resolutions in any case).

Elsewhere the design of the Mi Mix 3 is as appealing as ever, with its glossy black, tough ceramic coat and carefully crafted workmanship seen throughout. It is now lacking the 18K gold camera and fingerprint sensor surround, but while it was a nice thing to show off it never added anything other than a bit of bling.

The dual-camera and fingerprint scanner remain in the same positions at the rear, though we did notice more than previously how the camera's positioning causes the Mi Mix 3 to rock slightly when used on a desk or flat surface. And, as before, you'll find a volume rocker and power button on the right side, PIN-operated SIM tray on the left, and a USB-C port at the bottom. There's no physical home button, but you can opt for full-screen gestures or on-screen home, back and multitasking options.

It's still a downward-firing mono speaker – albeit a very good quality one, with minimal distortion at full volume – and there's still no headphone jack,

The Mi Max 3's downward-facing speaker has minimal distortion, even at full volume

and you won't find a USB-C to 3.5mm adaptor in the box. Instead you get a 10W wireless charger, which is incredible – we know of no other Qi-compatible smartphone that is actually bundled with the necessary charger.

New is an additional button on the phone's left side which calls up the Mi AI voice assistant on the Chinese version of the phone, and the Google Assistant on the UK Mi Mix 3. You can also change the function of this button to open the front or rear camera, turn on the torch, turn on Reading mode, or open Google Search or the previous app. Alternatively, you can turn it off completely.

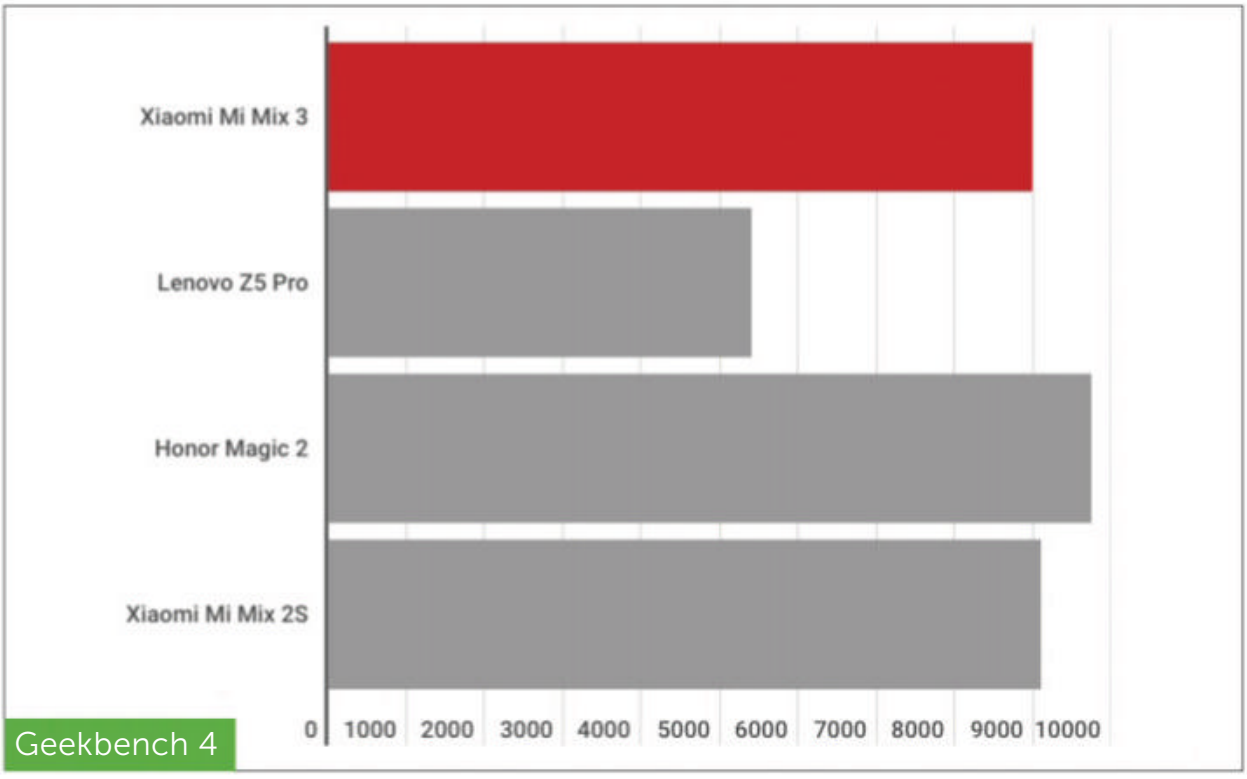
In the next revision to the Mi Mix line we'd hope to see waterproofing and an in-display fingerprint sensor – though not if it means that attractive price will rocket. Don't hold out your hopes for a higher-resolution display.

REVIEW

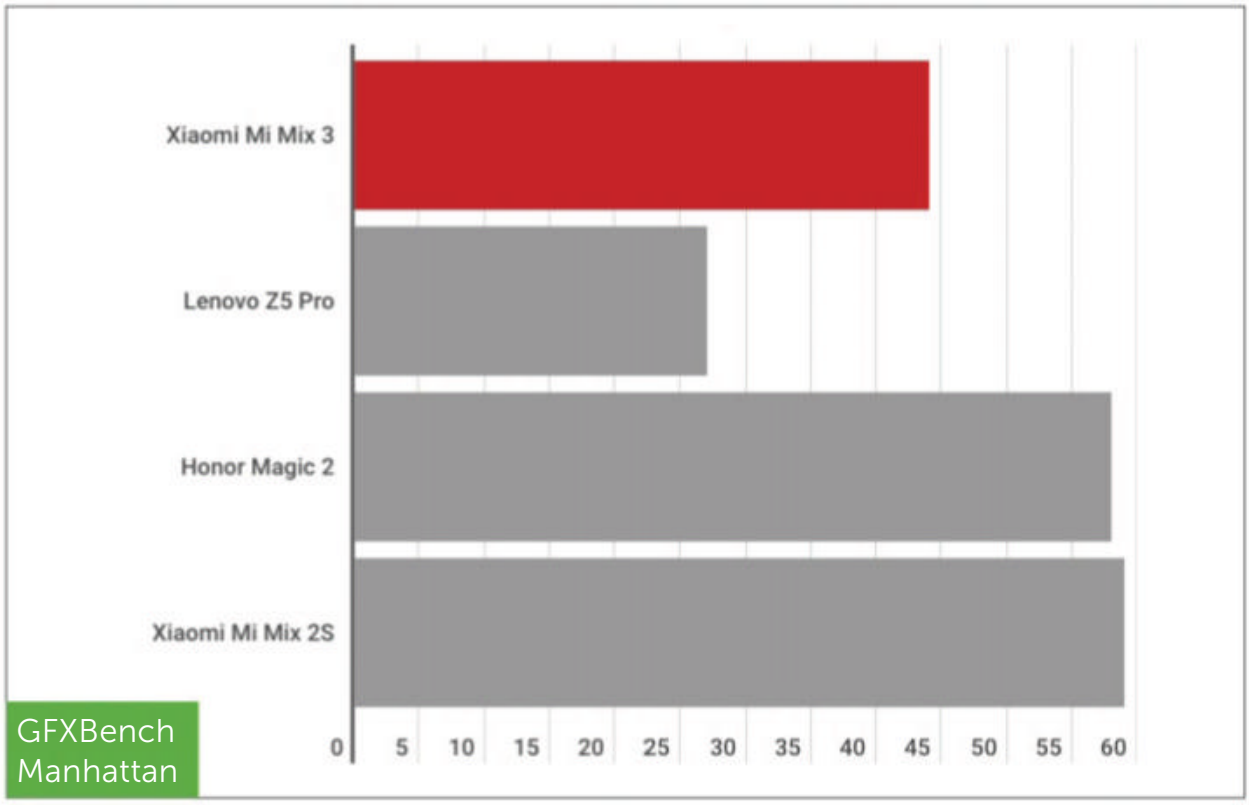
Performance

Inside the UK Mi Mix 3 is exactly the same hardware as you find in the Mi Mix 2S. This means you get the Qualcomm Snapdragon 845 running at 2.8GHz. It's an octa-core processor built on the second-generation 10nm manufacturing process, and integrates Adreno 630 graphics. This chip is paired with 6GB of RAM and 128GB of internal storage. It is not expandable through microSD, but sufficiently generous that this shouldn't be a problem.

As before we are blown away by its performance, despite the fact it actually performed a little slower in our benchmarks than did the Mi Mix 2S. It's normal for synthetic benchmarks to fluctuate, though, and it's the real-world experience that matters more. It can handle anything and everything, all at once.



Geekbench 4



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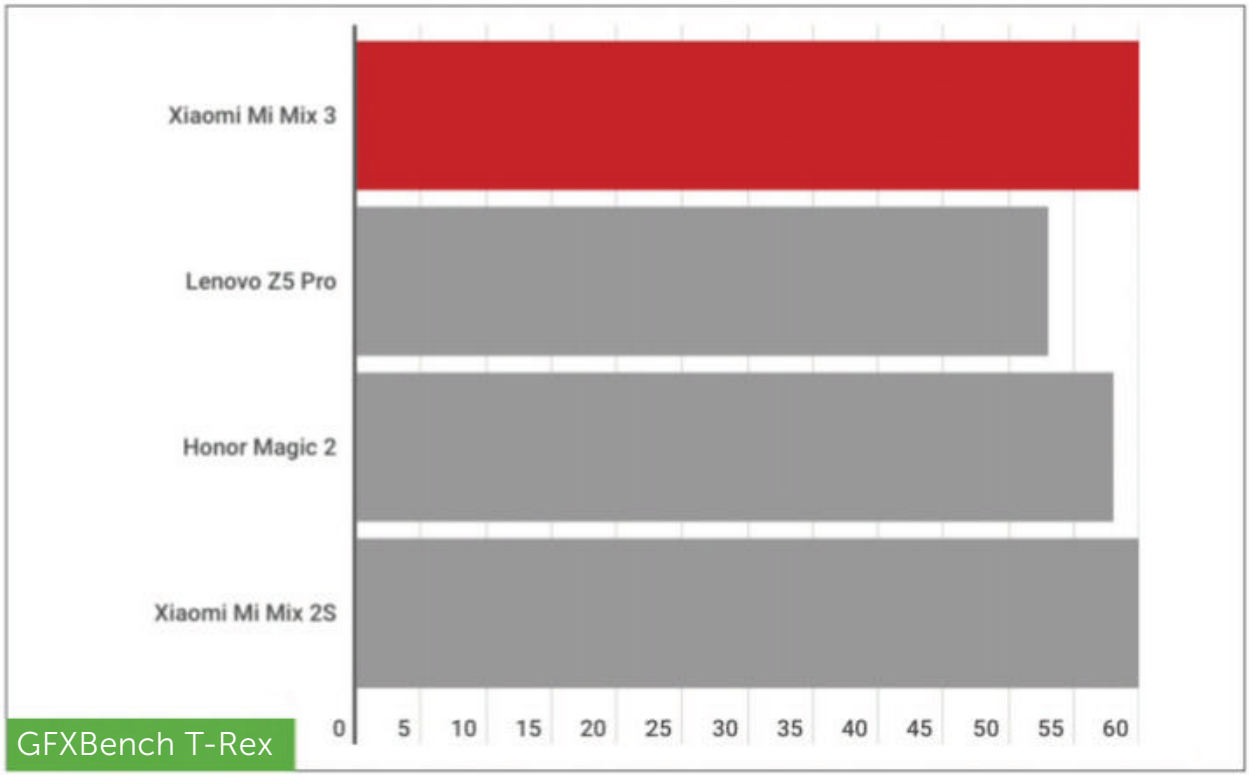
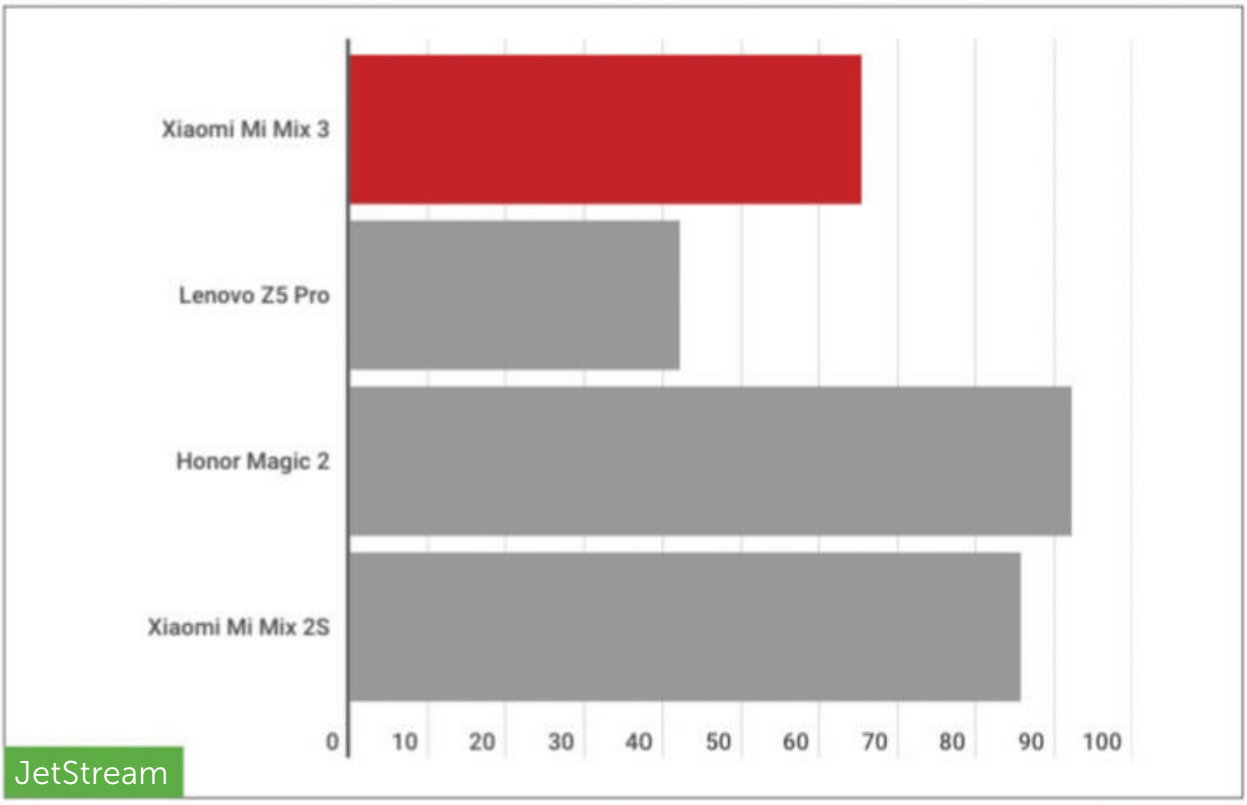


GFXBench T-Rex

REVIEW



We've charted its performance results here along with the Honor Magic 2, Lenovo Z5 Pro and Mi Mix 2S. The Honor is fastest with its 7nm Kirin 980 chip, and the Lenovo Z5 Pro slowest with its mid-range Snapdragon 710, though we have heard a Snapdragon 855 'Z5 Pro GT' version with 12GB of RAM is imminent.

In terms of connectivity there's everything here bar an IR blaster, which are increasingly rare but still found on some Xiaomi phones. There's support for 4G dual-SIM dual-standby, and complete coverage of UK 4G LTE network bands. You also get dual-band 802.11ac Wi-Fi, Bluetooth 5.0 and GPS and GLONASS, and while on the Chinese version the slider screen payment options are all Chinese services even here there is support for NFC and Google Pay.

As we noted the battery has been reduced by 200mAh, but Mi Mix 3 still supports Quick Charge and wireless charging (now with a 10W Qi charger and 18W wired charger in the box). You'll easily get a day's life from the phone, and potentially more depending.

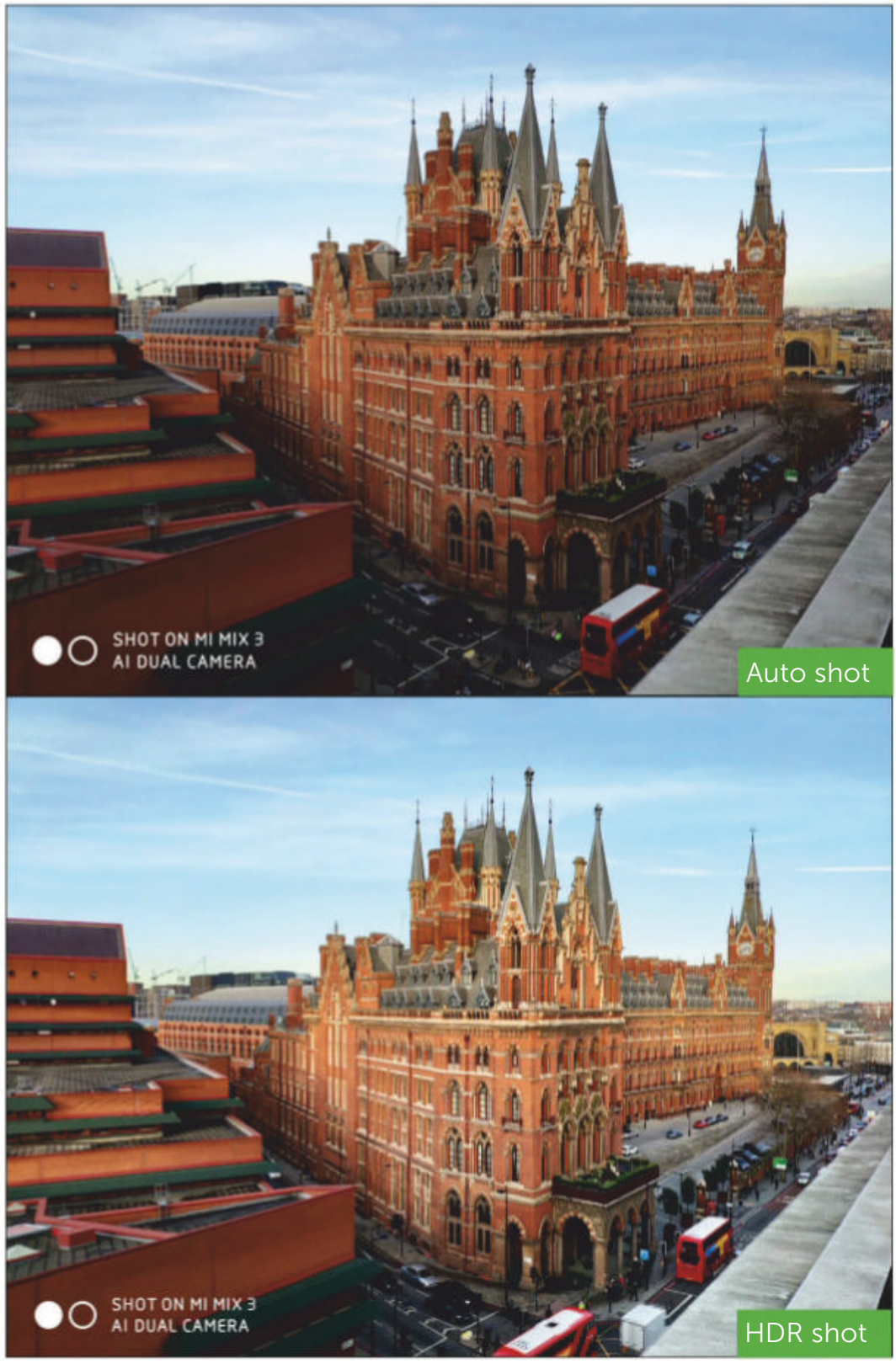
Cameras

We've already touched on the selfie camera, which has seen big changes in this new model, but the primary camera has some enhancements, too. As previously, it's a 12Mp and 12Mp dual-lens camera, but some software improvements mean the quality is higher than ever. Whereas Mi Mix 2S scored 97 points in the DxO Mark test (and the Mi 8, which uses the same camera, 99 points), this Mi Mix 3 nets 108 points.

The setup comprises one Sony IMX363 wide-angle lens with f/1.8 aperture, 1.4µm large pixels and Dual Pixel Autofocus, and one Samsung S5K3M3+ telephoto lens with f/2.4 aperture and 1µm pixels. The combo offers optical zoom and four-axis OIS, and is capable of 960fps slow-motion video. It's an AI camera, which means it can select the correct preset scene for your photo, without you having to give it too much thought. It can also use the second lens for Portrait mode in which it achieves bokeh-effect background blurring.

You can see some of our test shots overleaf. The first is a point-and-shoot from our seventh-floor office terrace, looking over the St Pancras Renaissance Hotel the other side of Euston Road. With no input from us the image is true to life with realistic colours and great detail, well exposed and sharp right to the edges.

REVIEW


SHOT ON MI MIX 3
AI DUAL CAMERA
Auto shot
SHOT ON MI MIX 3
AI DUAL CAMERA
HDR shot

Low light shot

With HDR mode engaged the shadows and highlights are enriched, but some evidence of blurring goes to show how important it is to hold still the camera during such shots, especially on a windy roof terrace. Even so it's still a very decent photograph that shows Mi Mix 3 is capable of great things.

We were less enthused by its low-light shots, and also surprised since the Mi Mix 2S seemed to handle these much better. The camera struggled to light the scene without resorting to the flash, and much noise is present. Of course we have seen significantly worse.

Software

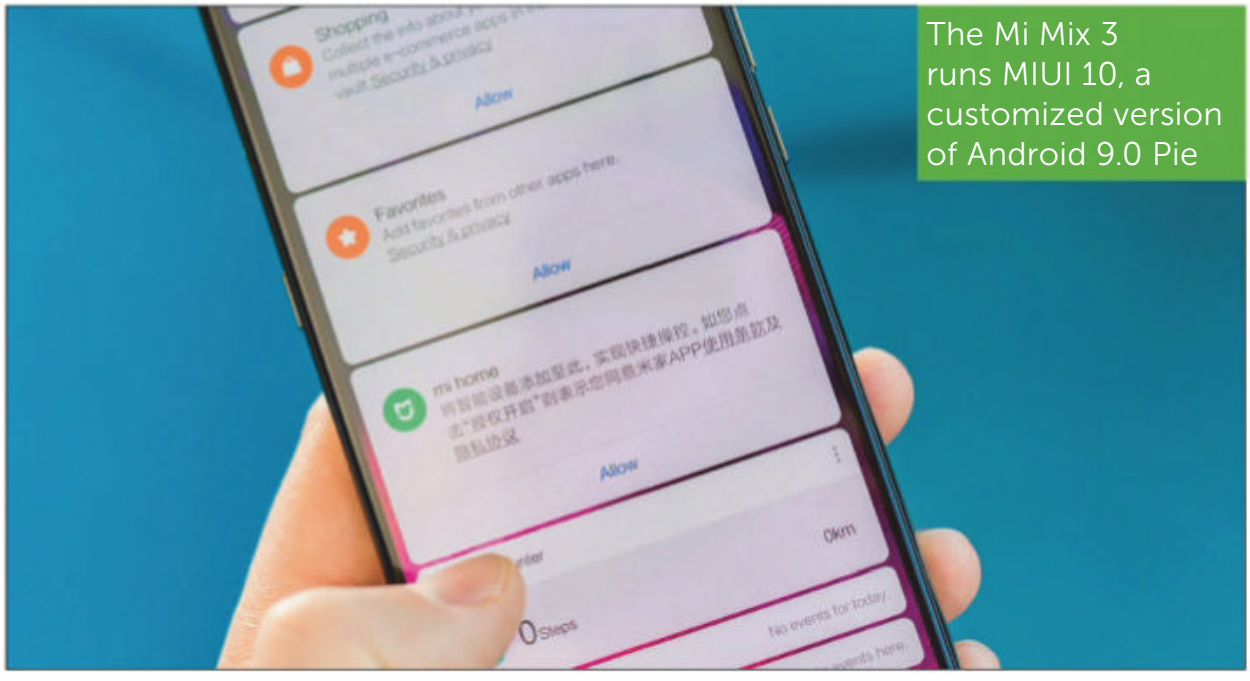
The Mi Mix 3 runs MIUI 10, which is a customized version of Android 9.0 Pie. The major differences

REVIEW

are found in the Settings menu, which is slightly reordered, in the drop-down notification bar and in the fact there is no app tray, so all app shortcuts are on the home screen. You an also change the theme, and you'll notice the default app icons look a little different to in standard Android.

If you've bought the Chinese version then note that they don't use Google services, so MIUI has its own apps for pretty much everything you'd ordinarily use Google's apps. You can use these, or you can install the apps with which you're familiar – but here is the catch: you'll need to install them yourself, unless you buy a UK or Global model.

A recent minor amendment to the procedure means you will need to have a SIM card in the phone before allowing it to install files from unknown sources, but we expect if you're setting up the Mi Mix 3 for personal use you will have installed a SIM



The Mi Mix 3 runs MIUI 10, a customized version of Android 9.0 Pie

in any case. Having used MIUI for many years we have found it quickly becomes familiar, and actually its extra features may make it preferable to standard Android. The likes of Dual Apps and Second Screen are worthy of high praise, particularly if you'll be taking advantage of the phone's dual-SIM functionality.

We're also keen on the backup options, which make it so much easier to get back to where you were following a factory reset, and you'll find features such as Split-Screen here, too.

A new addition here is Taplus, which we've not seen before on a Xiaomi phone, and the description suggests you tap and hold an item to learn more. We tried it but couldn't get it to work, so it could be only for the apps we're not using. The oddly named 'App Vault' is swiped in from the left of the home screen, and as you see on many Android phones pulls together quick access to your most commonly used apps, notes and calendar events.

Verdict

Swapping out the awkwardly placed selfie camera with a new dual-lens model that is tucked away behind the screen, the Mi Mix 3 is one of several new slider phones that shows how the concept 'should' work. Not only allowing a proper full-display view, but adding new quick-access functionality to the phone.

In other respects Mi Mix 3 is not a huge upgrade over the 2S, and actually loses some of its bling over its predecessor with the absence of its 18K gold camera surround. But it's still a great phone – fast, stylish, feature-packed and available at an incredible

price – and it's astonishing to see just how far the original full-display phone has come. Soon it will also be one of the first 5G phones in the world. **Marie Black**

Specifications

- 6.39in Full-HD+ (2,340x1,080) AMOLED display
- MIUI 10 (based on Android 9.0)
- 2.8GHz Qualcomm Snapdragon 845 octa-core processor
- 6GB, 8GB RAM
- 128GB, 256GB storage, non-expandable
- Dual-SIM dual-standby (2x nano)
- All UK 4G bands
- 802.11a/b/g/n/ac Wi-Fi
- Bluetooth 5.0
- GPS, A-GPS, GLONASS
- Rear-facing camera: 12Mp (wide), f/1.8, 1/2.55in, 1.4µm, Dual Pixel PDAF, 4-axis OIS; 12Mp (telephoto), 1/3.4in, 1µm
- Front-facing camera: Mechanical pop-up 24Mp, 1/2.8in, 0.9µm; mechanical pop-up 2Mp, depth sensor
- USB-C
- 3,200mAh lithium-ion battery
- Wireless charging (10W Qi charger supplied)
- 157.9x74.7x8.5mm
- 218g

REVIEW

Asus ROG Phone

Price: £799 inc VAT from **fave.co/2RqtwOk** ★★★★½

Gaming-focused smartphones are becoming more of a thing and we've been waiting for the ROG Phone since it was announced in June 2018. Read on for our thoughts.

Design

In many ways, smartphone design has become stagnant and boring, but that's not the case here. The ROG Phone is, as you might expect, eccentric and unconventional. ROG does stand for 'Republic

REVIEW

of Gamers' after all. Indeed, the phone has so many striking elements that it's hard to know where to look first. There are unusual shapes everywhere, from the glass around the camera to the rear-mounted fingerprint scanner. Then there's the large lump on the side, complete with exposed copper, which is matched on the front for the stereo speakers. And yes, the iconic ROG logo on the back lights up with customizable Aura RBG lights.

Overall, the device looks great, but you've got to be into this kind of style much like you do with Razer's Phone 2 – they're just very different approaches. Which you prefer is down to personal taste. Opinions at *Android Advisor* towers are split.

What you can't see here is the GameCool 3D vapour-chamber, which helps cool the device. This, along with a copper heat spreader, means 47 per cent improved CPU cooling efficiency, according to Asus. Those copper bits on the back aren't just for show either, they're air vents.

If that's not enough, the device comes with an AeroActive cooler in the box. This has a fan and

The iconic ROG logo on the back lights up with customizable Aura RBG lights

clips onto the phone via the slightly ugly looking custom USB port on the side. Not only does it add a controllable fan but USB-C and headphone ports too, so you can stay plugged in without the cable getting in your way while landscape gaming. That's a pretty neat idea and its also got a logo that lights up.

Also hidden is a set of 'ultrasonic AirTrigger touch sensors'. Two of these are used for shoulder buttons when landscape gaming while the other is used like the HTC U12 or Pixel 2 XL so you can squeeze the phone when in regular orientation. They only need a light touch – 20g where others can need four times as much force – and are customizable, so you can make the most of them with what matter most to you. For some games, such as PUBG, they're a godsend, while others see less impact. They're not perfect though, as you need a compatible game, and they also don't work well with games that require lots of tapping in a short space of time.

The supplied AeroActive cooler ensures your device doesn't overheat

To add an extra dimension to your gaming experience, the ROG Phone also comes with what Asus calls "advanced vibration haptics", so you can feel, for example, whether shots being fired are coming from the left or right.

The handset measures 158.8x76.2x8.3mm, which is roughly the same size as the Razer Phone 2. This is pretty big, plus it weighs 200g. That's more than most smartphones, but understandable considering everything that's going on and we didn't find the weight too much of an issue during our time.

That USB-C port we touched upon earlier can be used to connect the phone to a range of accessories, including a Mobile Desktop Dock so you can connect to a monitor, keyboard and mouse. There's also a Gamevice controller that lets you stream the phone to your TV via the Asus WiGig dock. This utilizes 11ad Wi-Fi and a TwinView Dock, which works a bit like a Nintendo DS to give you two screens.

Display

A large 6in screen makes sense here, to give you as much gaming real estate as possible. Asus has, however, gone for a different approach to Razer. Instead of a 120Hz LCD panel, the ROG Phone has a 90Hz AMOLED display with a 1ms response time. During our time with the phone, we found it was silky smooth in use. Note that the refresh rate is set to 60Hz by default.

The screen, like so many now, has an 18:9 aspect ratio and the resolution is Full HD+ (2,160x1,080) resulting in a decent 402ppi. That might be lower

We are impressed with display's contrast and colours

than the Razer Phone 2's 2,560x1,440 (513ppi), but it's enough to look perfectly crispy and might even help some games run better. The choice of AMOLED means contrast is better and we're also impressed with both colours and brightness. Furthermore, there's HDR support, so you can get the full experience if you're watching compatible content on something like Netflix.

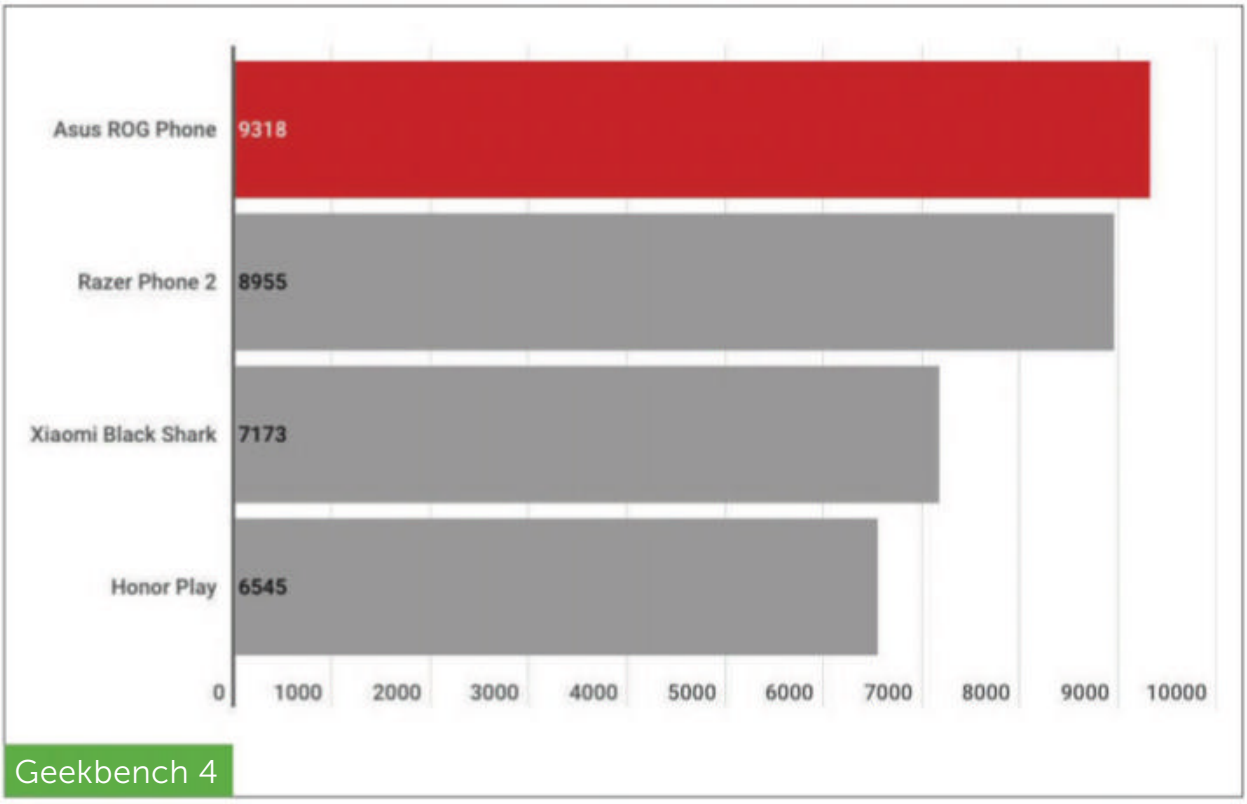
Performance

The ROG Phone continues to impress when it comes to core specifications. They are among the best we've ever seen on a smartphone.

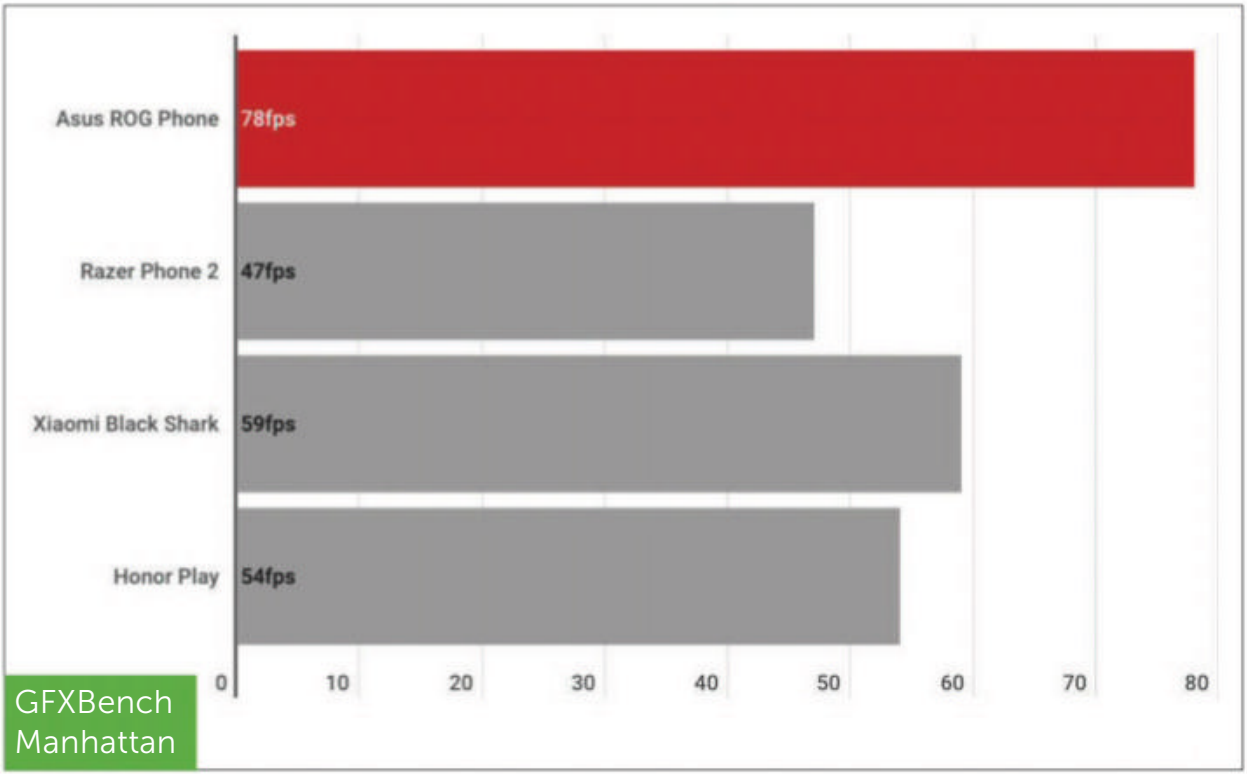
For starters, it has the fastest version of the Qualcomm Snapdragon 845 available. Asus says this has been 'speed-binned' to 2.96GHz – it's normally 2.8GHz. In the software you can even choose what clock speed you want in certain apps. Add in that there's 8GB of RAM as standard and this is some hefty amount of raw power. Asus claims it comes top in benchmarks such as AnTuTu, Geekbench and 3DMark.

The ROG Phone will also come with at least 128GB of storage but there will also be a model with

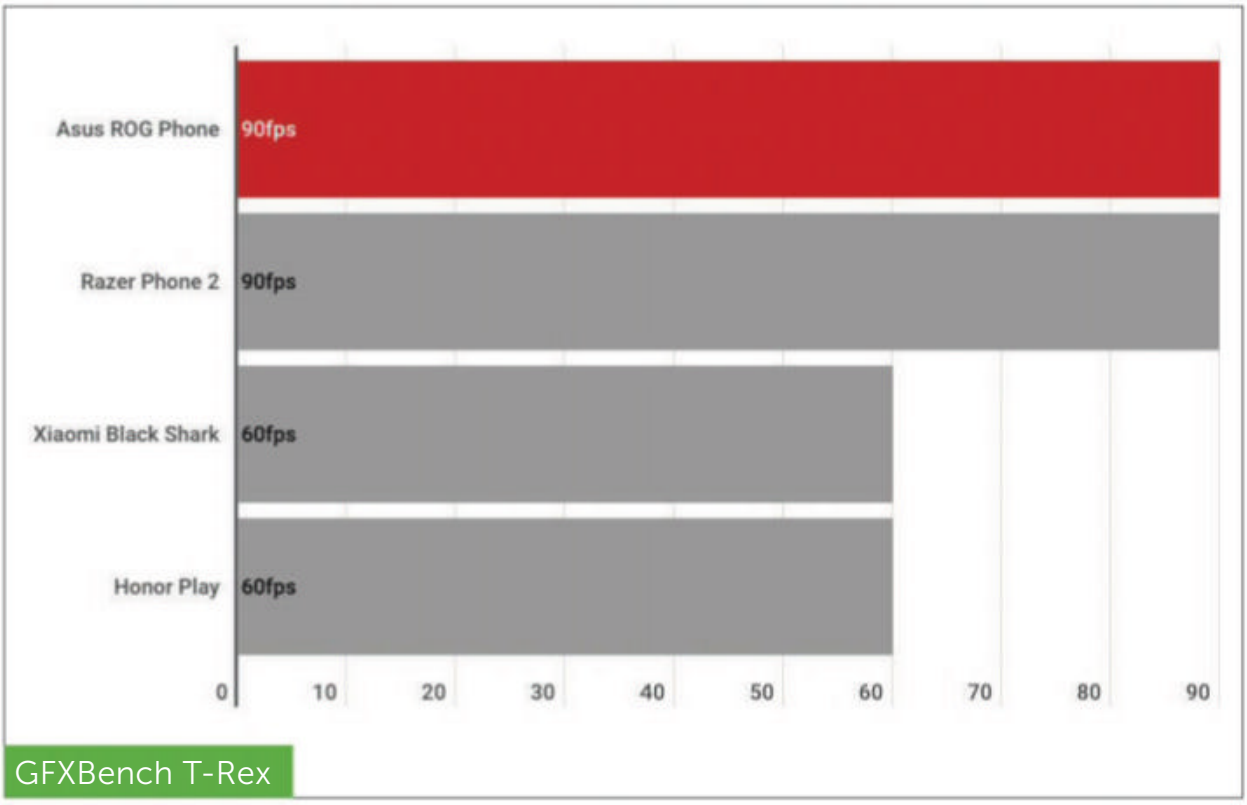
REVIEW



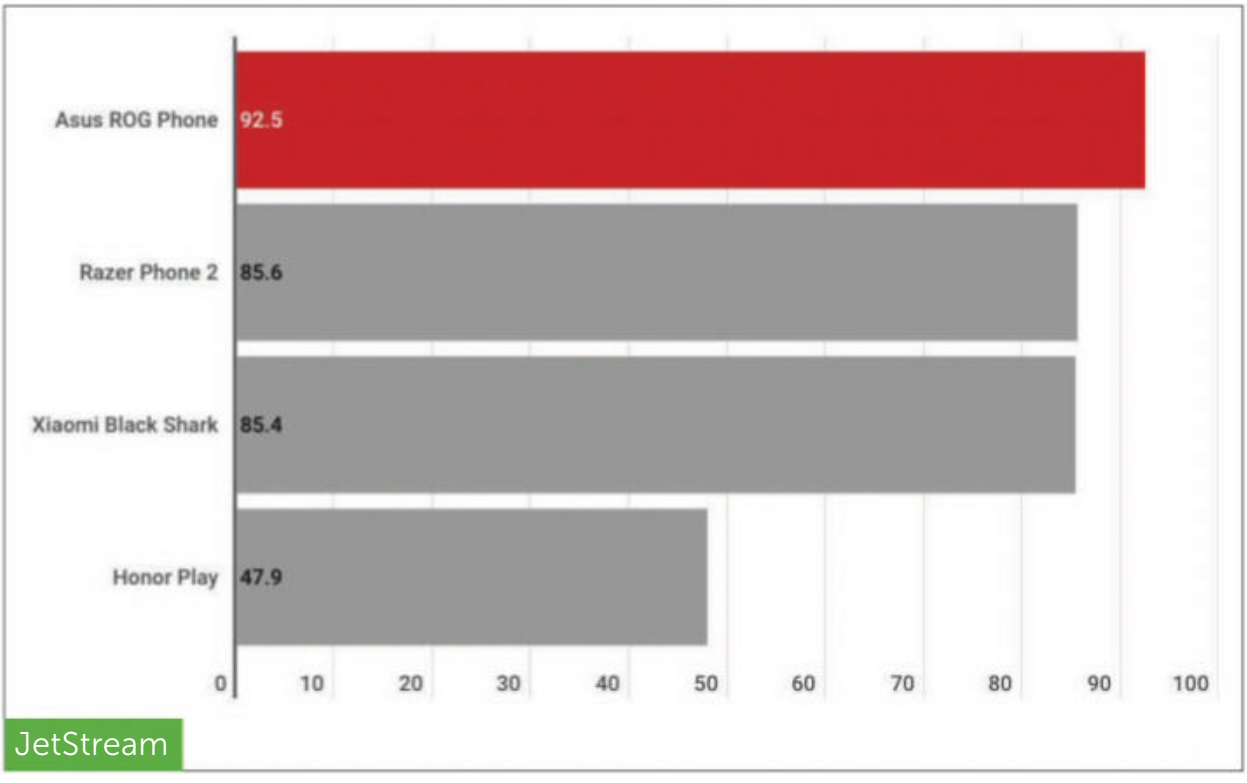
Geekbench 4



GFXBench Manhattan



GFXBench T-Rex



JetStream

a whopping 512GB. Sadly, we can't find the latter for sale in the UK. There's no microSD card slot making this more of a shame.

As you can see in our benchmark results are impressive. However, we didn't see any improvement when using the X Mode which promises better results. We've included the phone's rivals to see how it compares. The graphics results are particularly impressive, thanks partly to the 90Hz display. The Geekbench result, should you care, is not the highest we've seen with various phones, including the iPhone XR and Huawei Mate 20 Pro, beating it.

Cameras

With such a focus on gaming, Asus has barely drawn any attention to the cameras – something that is

Landscape shot

Macro shot

normally paramount on a modern phone. The ROG Phone does have dual rear cameras, though, at 8- and 12Mp. It appears to be the same setup as the Asus ZenFone 5 with the secondary camera offering a wide 120-degree view. At the front is a standard 8Mp camera.

If there's an area of the phone that lets it down a little, then it's

Low light shot

here. While photography is okay, there's nothing to write home about here. Considering the price, we'd usually expect a higher quality, but the focus here is gaming, not photography.

Connectivity and audio

The ROG Phone comes with up-to-date specifications, including NFC, GPS, Bluetooth 5.0 with aptX HD and the usual array of sensor you find on almost any phone such as light and proximity. There's also dual-band 11ac/ad Wi-Fi and up to 1.2Gb/s LTE (Cat 18) thanks to the Qualcomm X20 modem.

On the audio side of things is a headphone jack (plus the side one via the detachable cooler mentioned earlier), DTS Headphone:X with 7.1 virtual surround sound and Hi-Res Audio support. The highlight, though, is the front-facing stereo speakers that come with a 'smart amplifier'. They're easily some of the most powerful we've heard on a phone.

Battery life

Like the Razer Phone, the ROG Phone has a large 4,000mAh lithium-ion battery – when 3,000mAh is about the average for a new smartphone. How long it will last is a big question, especially with the higher speed Snapdragon 845 and high fresh rate on the screen. In our usual test using Geekbench 4, it lasted six hours and 27 minutes. This is a pretty middle of the road result. When gaming in 90Hz and reasonable brightness, you'll lose about 25- to 30 per cent for every hour you're playing. This means you'll be charging a lot, so it's a good job Asus has

The ROG Phone runs Android 8.1 Oreo

gone for quick charging. It's complicated though, as it depends which USB port you're using.

The traditional port on the bottom supports Qualcomm Quick Charge 3.0. However, the custom side port supports up to Quick Charge 4.0 and Asus's own HyperCharge direct charging, which can get the phone to a whopping 60 per cent in just 33 minutes. Even using the bottom port we got an impressive 54 per cent in 30 minutes, which is one of the best results we've seen.

Despite having a glass rear cover, the ROG Phone does not support wireless charging.

Software

The ROG Phone runs Android 8.1 Oreo software with Asus' own ROG Gaming UI interface that looks very appropriate for the style of the phone.

The way the interface works is fairly stock, but it looks very different to a phone like the Pixel 3. Asus

has gone to town with it, which is exactly what we'd expect for a device like this, and it's very specific target audience. Everything from icons to colours is overtly gaming in style. The interface even changes when you switch 'X Mode' on, including lighting up the borders around apps. The wallpaper even changes with a cool animation.

It's these little things that will really appeal to gamers and add value. A bit like the design of the phone itself, you'll probably love or hate it.

The Gamer Centre is the main addition when it comes to apps and if you've used Asus's desktop overclocking suite before you'll feel right at home. It provides plenty of information such as the temperature and clock speed for the CPU, as well as usage for memory and storage. You can also use the app to control things such as the Air Triggers, AeroActive fan speed and Aura lighting.

Game Genie is your friend if you want to customize things. If you're playing a game, then you swipe in from the right and select the controller icon to load the interface. It provides game capture, live streaming, and more. You can also set profiles for individual apps and games from within the Game Centre such as the maximum CPU speed, screen refresh rate, and more.

Verdict

The Asus ROG Phone is a little difficult to sum up because it's such a Marmite device – it will either be the kind of smartphone you've been waiting forever or pretty repulsive. One thing is for sure, and that is Asus has really gone to town with it and we applaud it

for doing so. If you're going to make a gaming phone, then you might as well go hell for leather right? There are plenty of features for hardcore gamers to make use of here, including the AeroActive fan, AirTriggers and all the customization withing the software. While it will be many gamer's dream phone, we don't blame you if you prefer the more understated style of the Razer Phone 2. **Chris Martin**

Specifications

- 6in (2,160x1,080, 402ppi) AMOLED capacitive touchscreen
- Android 8.1 (Oreo)
- Qualcomm SDM845 Snapdragon 845 processor
- Octa-core (4x 2.96GHz Kryo 385 Gold, 4x 1.7GHz Kryo 385 Silver) CPU
- Adreno 630 GPU
- 8GB RAM

The ROG Phone has plenty of features for hardcore gamers

REVIEW

- 128GB, 512GB storage
- Dual rear-facing cameras: 12Mp, f/1.8, 24mm (wide), 1/2.55in, 1.4µm, 4-axis OIS, dual pixel PDAF; 8Mp, 12mm, no AF
- 8Mp front-facing camera: f/2.0, 24mm (wide)
- Dual-band 802.11ad Wi-Fi
- Bluetooth 5.0
- A-GPS, GLONASS, BDS, GALILEO, QZSS
- NFC
- Fingerprint scanner (rear-mounted)
- USB 3.1, Type-C 1.0
- Non-removable 4,000mAh lithium-ion battery
- 158.8x76.2x8.3mm
- 200g

FEATURE

15 essential Google Assistant commands

RYAN WHITWAM reveals how Google Assistant will make your smart home smarter

Google Assistant is everywhere, ranging from the Android smartphone in your pocket to the smart speakers and smart displays ensconced in your kitchen or living room. And that means you can control all your smart home devices without so much as turning your head.

All you need to say is "Hey Google!" What do you say after that? Well, almost anything, but here are 15 essential commands you should commit to memory.

1. Get a weather report

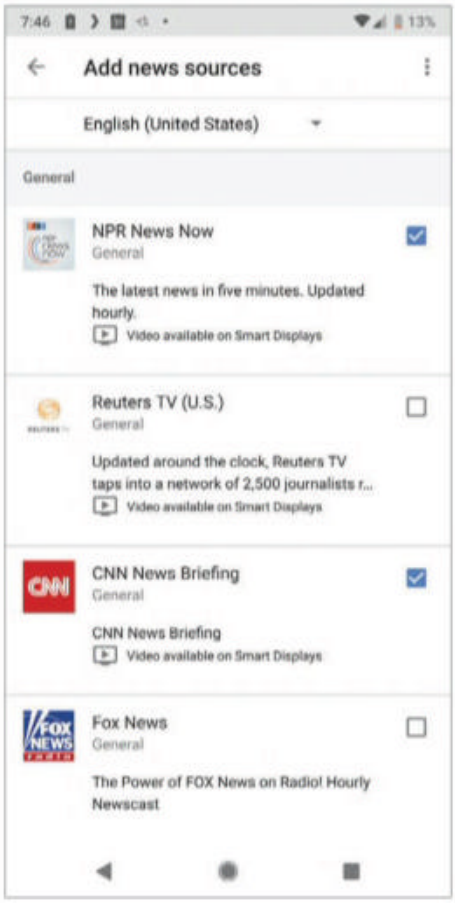
One of the simplest commands is probably also one of the most useful. As you're getting ready to head out the door, say "Hey, Google. What's the weather like?" You'll get a succinct explanation of the current conditions and the forecasted conditions for later in the day.

2. Read the news

Want to know what's going on in the world? Just ask Google Home to "read the news". You can use the Google Home app on your phone to control which news sources Google uses, too. Open the Google Home app, click the Account icon at the bottom right, click Settings (under General Settings), and then Services (from row below your account name). Tap News in this list, then tap 'Add news sources', which will present you with a list. Place a check next to each of the services you'd like to subscribe to, and then click the left-pointing arrow at the top of the screen. When you return to the News screen, you can arrange the order in which your news sources will report.

If you want news about a specific topic, you can say something like "Hey, Google. What's the latest tech news?" Google Assistant will play an audio report on compatible smart speakers, or display a video on a smart display. You'll also get a series of links to other news stories in the Google Home app (you can find

You can choose from a diverse collection of resources for your news updates



them by clicking on the compass icon at the bottom of the app).

3. Set a reminder

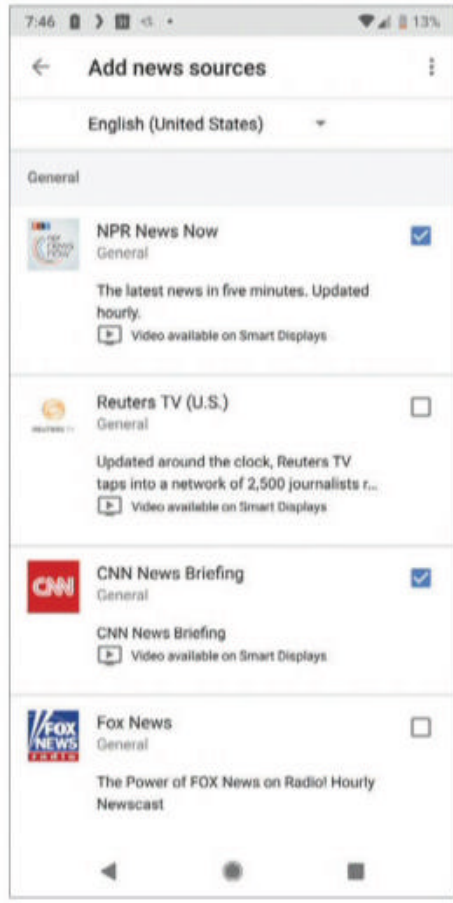
Google Home was famously unable to set reminders at launch, but Google eventually solved that issue. You can now tell Google to remind you to do something. Just say "Hey Google, remind me to take out the rubbish... mow the lawn... clean the gutters..." or whatever you need reminding about. If you don't specify when you need to be reminded, Google Assistant will ask "When do you want to be reminded?" If you don't state a specific time, it will ask for that information as well. You can set repeating reminders, too; for example, "Remind me to take the garbage can to the curb every Monday at 6pm". The reminder will appear on your phone, but Google Home smart speakers will also light up to let you know there's a pending reminder. Just say "Hey Google, what's up?" to get details.

4. Set a timer or alarm

Need a better alarm clock? That's Google Home. Tell Assistant to "Set an alarm for [time]", and you're done.

FEATURE

Google Assistant can wake you up to music from your favourite artists



You can also set a recurring alarm by saying "Set an alarm for every (Monday, weekday, Saturday...) at (time, am or pm)." If you're a Google Play Music subscriber, you can set an alarm that wakes you up with music, instead of a general alarm tone. Just say "Set [artist name] alarm for [time, am or pm)."

When the alarm goes off, you can tell Google to stop the alarm or to snooze it for however long you want. The alarm will sound for 10 minutes if you don't end it earlier. Since smart speakers don't have battery backups, it might be a good idea to plug the one you're using as an alarm clock into an uninterruptible power supply, in case there's a power outage.

To set a simple countdown timer, just say "set a timer for (seconds, minutes, or hours)".

5. Remember things

This command is slightly different from a reminder, as it's not necessarily related to a time or date. Your squishy human brain is fallible, but Google Home can remember things for you, and it never forgets – unless you ask it to. Just ask your Google Home

to "Remember (X)" and it will tuck that factoid away. For example, you can say "remember my spare car key is in the kitchen junk drawer". Accessing this info is easy, just ask Google Assistant what you told it to remember. If you've asked it to remember several things over time, you can be more specific with your query: "Where is my spare car key?" for example.

6. Maths without a calculator

Sure, there's a calculator on your phone, but you don't even need to touch it to get the answer to a vexing numerical query. Just ask Google to perform a calculation or conversion, and it'll reply instantly – much faster than your fingers can type out the query.

7. Flip a coin

Just can't make a decision? You don't need pocket change to let lady luck decide. Tell Google to "flip a coin", and you'll get the result immediately. There's even a coin-flipping sound to complete the illusion (sorry, there's no animation on Google-powered smart displays).

8. Create a calendar appointment

Making a calendar appointment can be tedious, but Google Home can handle all the work for you. Simply tell Assistant you want it to "Create a calendar appointment" or something similar. Google Home will ask for the title, date, and time before adding the item to your calendar. Be sure you set up voice matching if you share a Google Home with other users in your household.

9. Play music

You can tell Google Home to play a specific artist or song, but you don't need to get that specific. You can ask Google to play different genres or something vague like 'relaxing music'. Make sure you've connected a music service in the Home app (Spotify, Pandora, or YouTube Music, for example) to get the best results. To do this, follow the same steps in the Google Home app that you used to select news services, but click Music to link to your service provider of choice.

10. Place a call (or a video call)

Google Home devices let you place a call, and you don't even need to have your phone around. If you've allowed Home to access your account, just say "Call

A Google Home speaker that has both a screen and a camera, such as the Lenovo Smart Display shown here, allows you to make video phone calls

(contact)". You can also read off a number for Assistant to call. It's like a speakerphone call, but with better audio. You will want to use the Home app to configure the number that appears on caller ID, though (you can provide your own smartphone number, or you can leave it labelled as 'unlisted'.)

You can also make video calls to and from display-equipped Google Home devices, such as Lenovo's Smart Displays or the JBL Link View (the Google Home Hub famously does not have an on-board camera). Just say "Make a video call to [name of smart display]" or "Make a video call to [phone number]". The person you're calling will need to have Google Duo (available for both Android and iOS) installed on their smartphone (or smart display, as the case may be).

11. Track a flight

We've all been there: you need to pick someone up from the airport, but you don't know if their flight is on time. Just ask Google Home "What's the status of (airline, flight number)?"

12. Get a translation

The Google Translate app is ideal if you need a lot of translations, but if you just need a word or phrase, ask Google Home: "How do you say (hello, thank you, good night...) in (French, Japanese, Mandarin...)?" You'll have your answer immediately.

13. Listen to relaxing sounds

The world can be noisy, and sometimes it's easier to cover up the noise than to eliminate it. If you

need to drown out the world, ask Google Home to play white noise. You can also ask for other ambient sounds, including rain, thunderstorms, and more. Be careful how you phrase your request, though. If you say "play a thunderstorm", Google Assistant might misinterpret your request and start playing music. A better command would be "play the sound of a thunderstorm".

14. Tell me about a day

Google Home can be useful from the moment you wake up in the morning. Just say "Tell me about my day", and Google Assistant will do just that. You'll hear the time, weather forecast, upcoming calendar events, reminders, and the top news stories. It really ties everything together – provided, of course, that you rely on Google Calendar to manage your schedule.

15. Play a game

That's enough getting things done – sometimes you just want to have some fun, and Google Home can be an amusing diversion. You can jump right into a multi-choice trivia game by saying "I'm feeling lucky". You can play that alone or with friends. If you say "play a game", Google Home gives you a variety of options, including Crystal Ball and Mad Libs.

HOW TO Secure, protect and lock down a phone

MICHAEL SIMON shows how to put your phone to work for you

Android phones might get a bad rap, but they're actually quite secure. Or at least they can be. With a little work, your Galaxy, Pixel, or OnePlus phone can be a veritable fortress, virtually impenetrable to hacks, attacks, and bad apps. So whether you're looking for a little extra security or a complete lockdown of your phone, here's everything

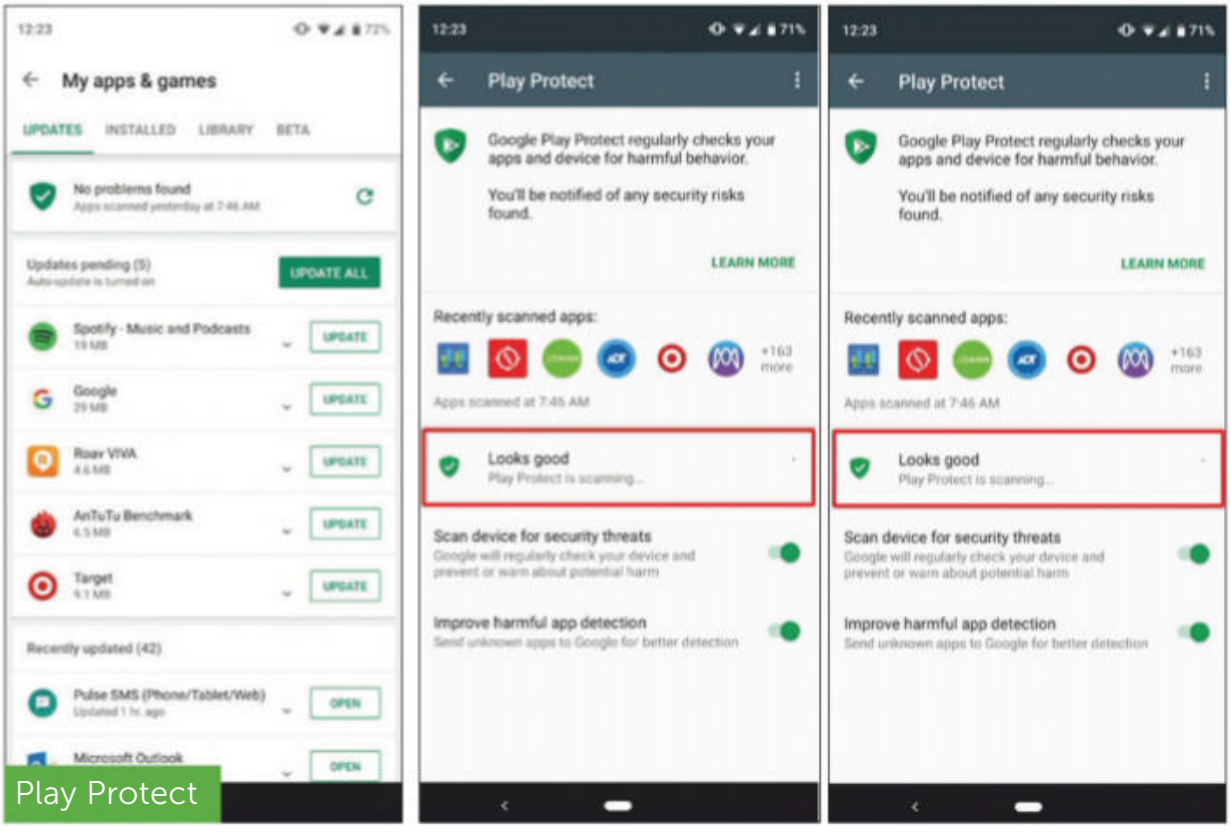
you need to keep your data from falling into the wrong hands.

Android security: Default protection

Even if you skip the entire setup process and ignore every safeguard prompt, your Android phone still does plenty to keep your information safe.

Play Protect

Google has built a malware scanner right into the Play Store called Play Protect. First and foremost, it runs a safety check on apps before you download them, but more importantly, it also checks your phone for any apps that may have gone awry since you downloaded them. If it finds any, it will warn you via a notification



Play Protect

and in extreme cases delete them from your device on its own. You can check your Google Play Protect settings and see the apps it scanned in the Updates tab inside the 'My apps & games' section of the Play Store.

Encryption

Ever since Android 5 Lollipop, Android has offered full-device encryption by default, as long as you set some kind of an locking method on your phone (pattern, pin, or password). In Android 7 Nougat, that switched to file-based encryption, but the end result is essentially the same: the data on your phone is protected by 256-bit AES standard encryption as soon as its locked, so unless someone knows your passcode, they can't see anything.

Android security: Basic protection

You don't need to be a paranoid android to put a basic layer of protection on your device, you only need to change a few settings.

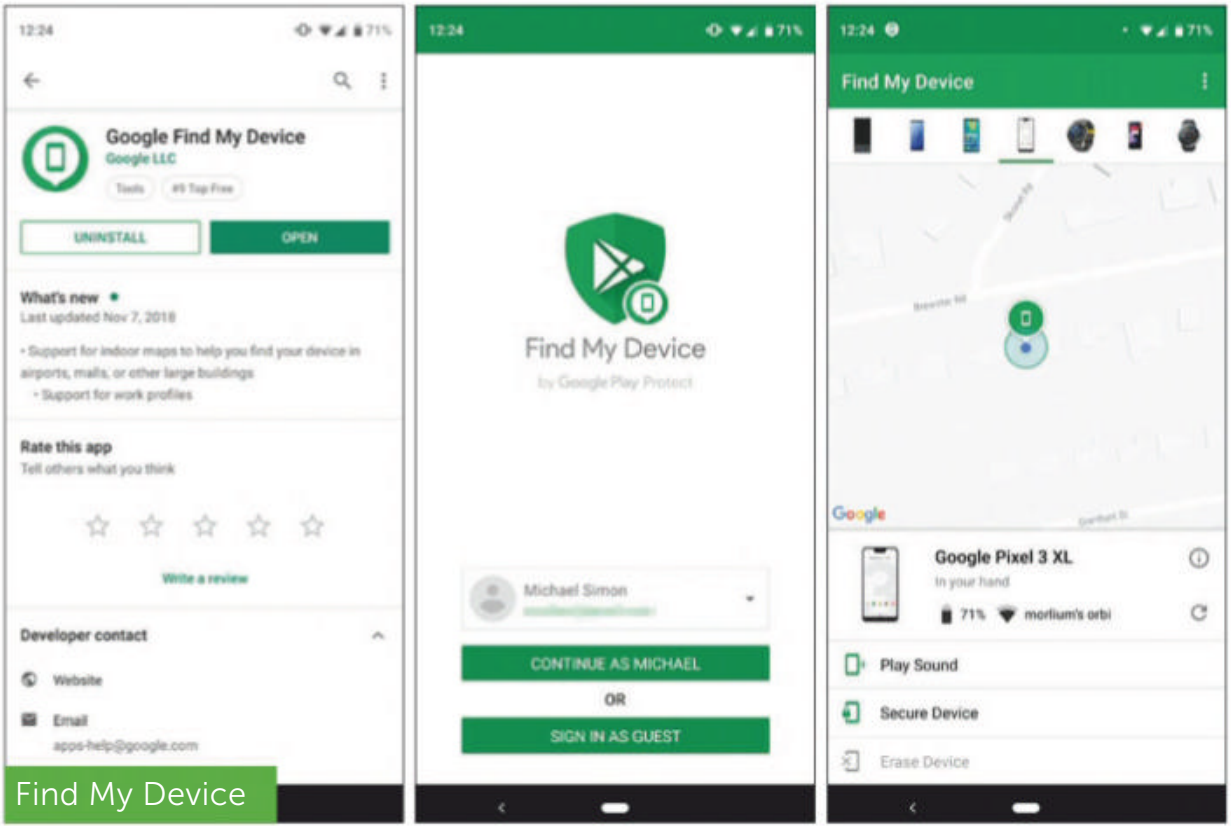
Set a password

While newer Android phones offer numerous biometric methods for unlocking, every phone still requires one of three traditional locking methods: pattern, PIN, or password. They're not created equal, though. A pattern is easiest to remember but the least secure. A 6-digit pin is better, but the best of all is a random password. But even if you choose a string of letter and numbers, you should set a reminder to change once every six months or so. And make sure it's not the same as the one that protects your primary Google account.

HOW TO

Turn on 2-step verification

Your Google account is central to everything that happens. As the name suggests, with 2-step verification, you're adding an extra layer of protection, so even if someone steals your password they still won't be able to get into your account. Here's how it works. After you're prompted to enter your Google password, a code will be sent to your default phone via text or call which will need to be entered in order to grant access your account. While this won't necessarily protect your phone against theft, it will protect what's on it. For example, if someone tries to remotely log in to your Google account from another device, you'll know via the 2-step message on your phone. And then you can take the appropriate action and change your password.



Install Find My Device

Find My Device (free from **fave.co/2Roynj0**), it lets you track, lock, and erase your handset from wherever you are with just a tap. After downloading, you can sign in using your Google account and allow it to access your device's location. From then on, you'll be able to log into Google's Find My Device site (**fave.co/2B7QLXO**) and instantly locate where your phone is if you lose it. You'll also be able to remotely lock your device, display a message or phone number for whomever finds it, or completely erase all of the content on your phone.

Stay updated

Google releases monthly security updates for Android that most newer phones distribute in a relatively timely manner. You don't need to check for them – once one is available, your phone will automatically let you know. But don't delay, because it's easy to forget about them. Set or schedule an update to be installed as soon as your phone lets you know it's available. It only takes a few minutes and it could make all the difference.

Android security: Moderate protection

Now that the basic stuff is out of the way, let's work on putting an even stronger lock on your Android phone.

Set up fingerprint unlock

A password might be a strong way to secure your phone, but it can't beat your fingerprint. And if you bought your Android phone within the past two years,

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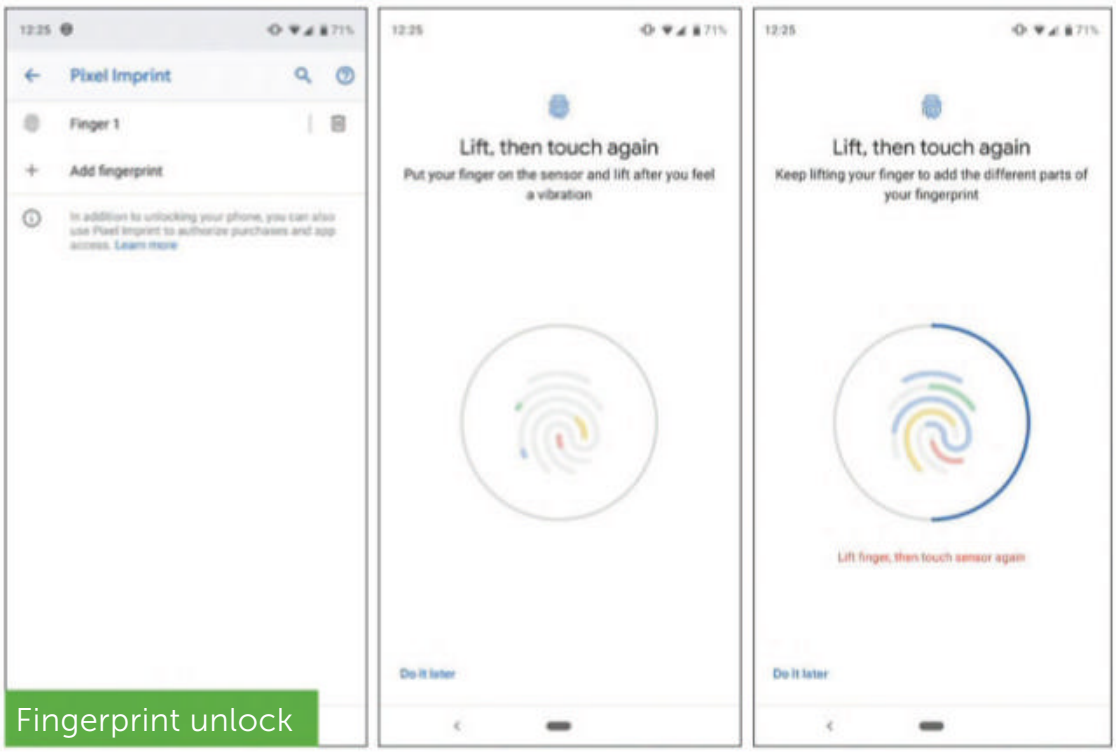

Pixel Imprint
Finger 1
Add fingerprint
Lift, then touch again
Put your finger on the sensor and lift after you feel a vibration
Do it later
Lift, then touch again
Keep lifting your finger to add the different parts of your fingerprint
Lift finger, then touch sensor again
Do it later
Fingerprint unlock

there's a good chance it has a fingerprint sensor either below the screen, on the back, or built into the power button. Find it and head over to your security settings to register one or more fingerprints. It only takes a few seconds to enact a very important layer of protection.

Numerous phones also offer face unlocking, but unless you have a Huawei Mate 20, you should skip these. That's because most phones use the 2D front camera to scan your face rather than a 3D map like with Face ID on the iPhone or Huawei's depth-sensing camera, so they're very easy to spoof with little more than a picture.

Prevent unknown downloads

One of the greatest benefits of Android is also one of it's biggest risks: downloading apps that aren't on

the Play Store. When you install an app from outside Google's store, you're losing out on Play Protect and opening your phone up to possible malware. To keep a lid on any potential trouble, Google has built a way to shut off any accidental or unintentional downloads. In the Special app access settings, you'll find an Unknown sources or Unknown apps tab, which lets you shut off the installation of apps from a non-Play Store source, such as Chrome or some other browser.

Depending on your phone, the mechanism is a little different. Up until Android Nougat, there was a single toggle that let you either block or install apps from unknown sources. In Android Oreo and later, permission is granted on a per-app basis, so you can allow Chrome or Slack to install apps while blocking others. It's a good habit to visit this setting every once in while to make sure there aren't any malicious apps that are allowed to install software behind the scenes. If you find any that are, tap the name and turn the toggle off.

Uninstall apps

Speaking of wayward apps, one of the best ways to keep your system safe is good, old-fashioned house cleaning. Simply jump into your app drawer and simply uninstall apps that you haven't used in a while. It'll free up storage and it'll make sure they don't turn into potential risks.

Check app permissions

It's also a good idea to check in on your app permissions every now and again. When you

download an app from the Play Store and launch it for the first time, Android asks you if it can have access to things like the microphone, camera, phone, and so on. A lot of times we just tap away access without even realizing what they're asking for, but you can always go back and revoke it after the fact. Head over to the Permissions tab inside Apps in Settings and you'll be able to see which apps are allowed to do what – and turn off anything that looks suspicious.

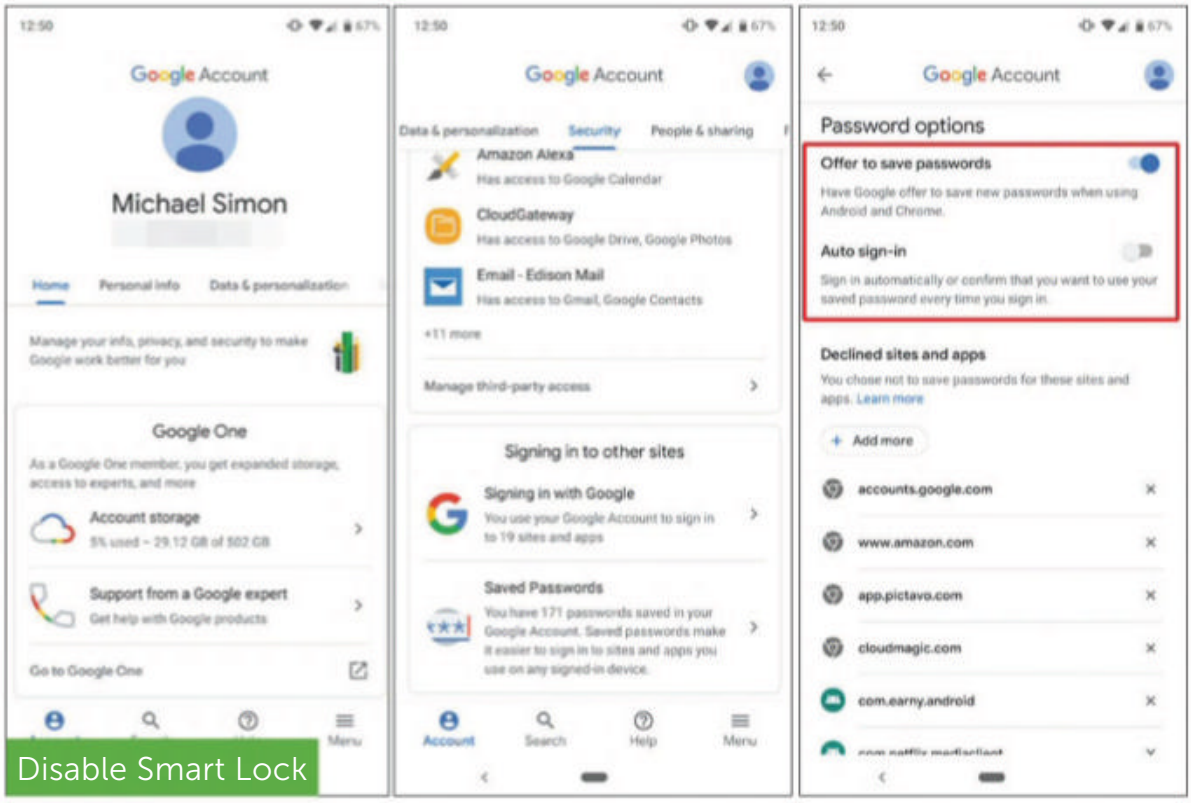
Android Security: High protection

If you came here to learn how to turn your Android phone into a vault, here's what you need to do.

Disable Smart Lock for Passwords and Auto Sign-in

Smart Lock for Passwords might be convenient, but if you want to lock down your phone, you're going to need to handle your passwords on your own. And that unfortunately means turning off Smart Lock for Passwords. Here's why: Google's method doesn't use any kind of authentication on a per-site or account basis like password managers do, so after signing in to your account for the first time on your device, all of your passwords will be available. That obviously could be a problem if someone swipes your phone.

You'll find the toggle inside the security settings for your Google account, not inside the Security tab in Settings. Once you get there, tap on Security, then scroll down to Signing in to other sites, and tapped Saved Passwords. You'll see two toggles: Offer to save passwords and Auto sign-in. If you don't want to



Disable Smart Lock

turn the whole thing off, you can also select sites that ignore auto sign-in. We think a much better solution would be to require biometric authentication every time a password is entered (which Apple does on the iPhone), so until that happens, you should switch it off if you're paranoid.

Download a password manager

If you're turning off Smart Lock, the only way to keep your passwords safe and organized is to lock them up inside a password manager. Stronger and more secure than the Smart Lock password sync Google offers, a password manager encourages unique, complex passwords, lets you organize and manage multiple logins, and stores sensitive notes, credit card

information, and anything else you want to keep in a digital locker. And it's all protected by a password or a fingerprint, whichever you choose.

Since your password manager is a separate service, you'll be able to access your passwords on any device or browser, so even if someone steals your phone your most personal data will still be protected. And with Android Oreo, you'll even be able to incorporate some of them into Autofill on your phone (fingerprint-protected, of course).

Our favourite password manager is LastPass, but there are plenty of great options out there. You'll need to pay an annual fee, but it's worth it.

Use a VPN

No matter how many safeguards you add to your phone, it's inherently vulnerable every time you visit the web. Why? Because the information you send can be stolen and spied on with little effort, especially if you're using a public Wi-Fi hotspot. If you use a VPN service, your information is encrypted before it hits the airwaves, so your data is fully protected from everybody except the VPN provider and whatever website you're visiting. Even if someone manages to steal it, it's protected. There are numerous VPNs in the Play Store, so make sure you check out the rankings and user reviews before making your pick. Our recommendation for starting out is TunnelBear (**fave.co/2WzH51E**), which is free and super simple. If you're looking for something more advanced, you can download OpenVPN for Android (**fave.co/2Tj0rWz**) and experiment with Mullvad (**fave.co/2B5Tscw**).

Use an Authenticator app

We've already discussed how important 2-step verification is for your Google account, but you should also be using it for any service that offers it: Twitter, Facebook, Dropbox, and so on. But if you want to take it one step further, you can use an authenticator app (free from **fave.co/2B7ZHfU**) to generate unique codes right on your phone rather than sending them over SMS text messages, which can be riskier. Google makes its own authenticator app for your Google account and many other sites that's free in the Play Store, so we recommend checking it out.

Get a physical security key

If you want the ultimate protection for your accounts, nothing beats an NFC security key. Roughly the size of a flash driven (so you can attach it to a keychain) and

Yubico offers a range of security keys

completely phishing-proof, a security key dispenses with codes and stores all of your authentication on a physical device. So it's basically impossible to get into any of your accounts without the key, even if someone manages to steal all of your passwords. Yubico has a range of keys on its website: **fave.co/2B9k3Fs**.

Enter Lockdown mode

If all else fails, Google has added a new Lockdown option to Android 9 that lets you completely secure your phone at a tap. Hold down the power button for a second and you'll see a Lockdown option at the bottom of the list. (If you don't, you can enable it in the Lock screen settings.) Tap it and your phone will instantly lock, turn off the fingerprint scanner (so someone can't force your finger to unlock it), remove all notifications from the lock screen, and disable Smart Lock. And it'll stay that way until the next time you relock your phone.

HOW TO Unlock and enable Developer options on any Android phone

Google's tools can be fun to play with, writes MICHAEL SIMON

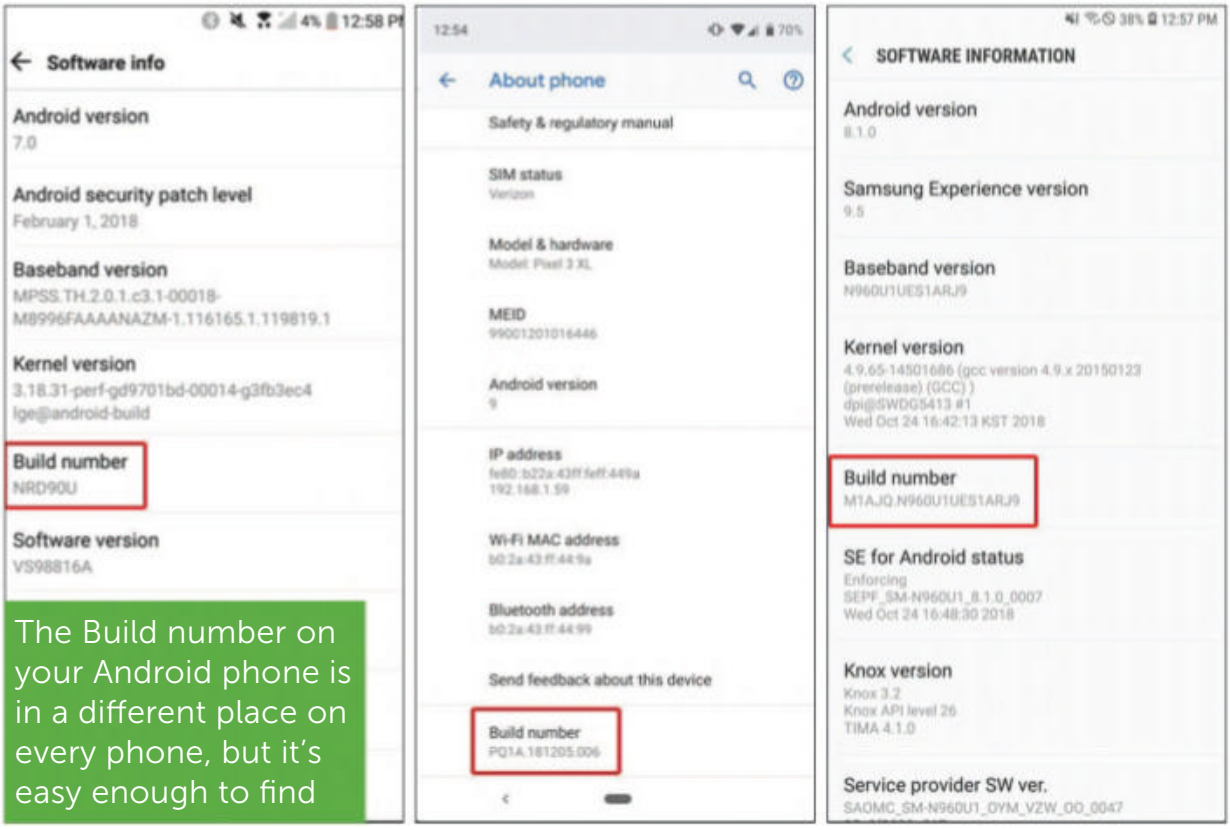
Even if you're wary about rooting your Android phone and installing a custom ROM, you can still try out some features and settings that aren't turned on by default. Every Android phone comes equipped with the ability to enable Developer options,

which lets you test some features and access parts of the phone that are usually locked away. As you might expect, Developer options are cleverly hidden away by default, but it's easy to enable if you know where to look.

Find your Android Build number

Before you can enable Developer options on your Android phone or tablet, you'll first need to find your phone's build number. On most phones, you can simply type build number into the search field, but here's how to find it on a few popular devices:

Google Pixel: Settings > System > About phone > Build number.



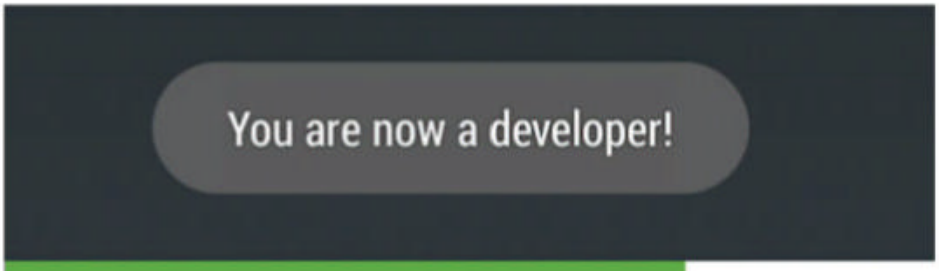
The Build number on your Android phone is in a different place on every phone, but it's easy enough to find

Samsung Galaxy S8 and later: Settings > About phone > Software information > Build number.
LG G6 and later: Settings > About phone > Software info > Build number.
HTC U11 and later: Settings > About > Software information > More > Build number.
OnePlus 5T and later: Settings > About phone > Build number.

Reveal Developer options

Once you've found the screen with your Build number, you'll need to tap on it seven times. That's right: seven times. After a few taps, you'll see a small pop-up alert telling you that 'You are now X steps away from being a developer' with a number that counts down with every additional tap.

After the seventh tap, a message will appear telling you that 'You are now a developer' and the Developer options will be unlocked as an option in Settings. Some phones will include a general message about tinkering with your Android phone, but you can simply tap OK. While many of the options are strictly for developers, including things like USB debugging and bootloader unlocking, you'll also find things such as



When the Developer options are unlocked, you should see something like this

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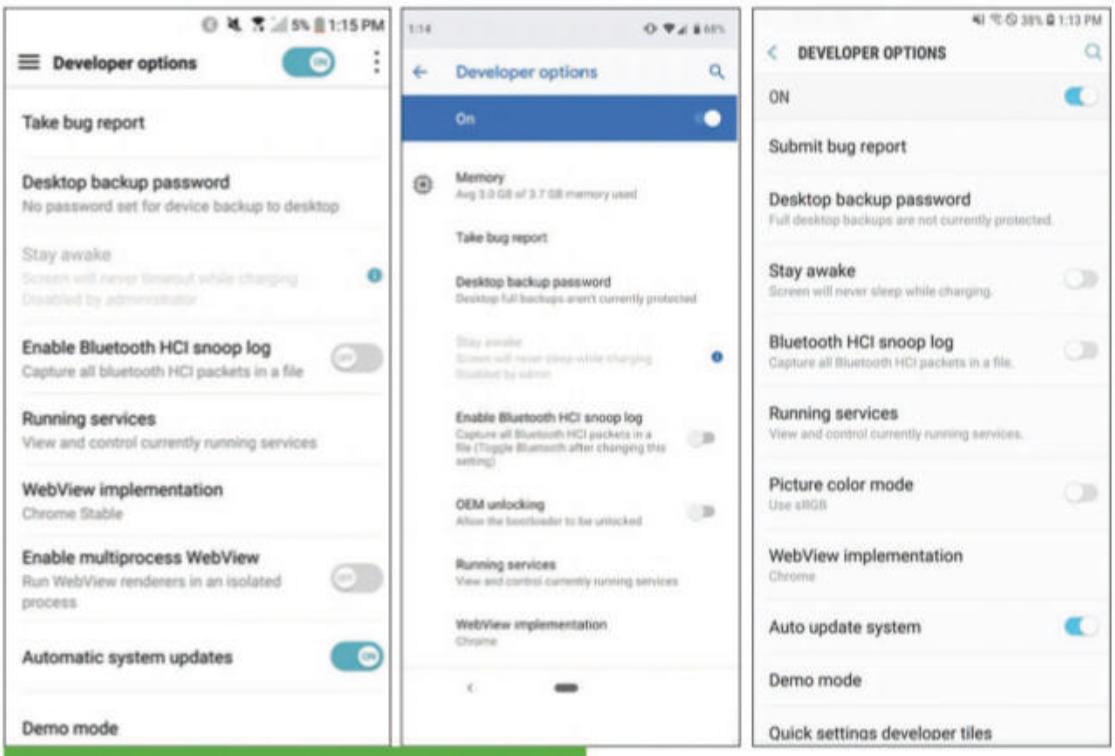

Developer options feature a treasure trove of toggles—but be careful

hi-fi audio codecs, notch options, and CPU usage among the toggles. Experiment at your own risk.

Turn off Developer options

While Google used to require a factory reset to rid your phone of Developer options, it's easier to jettison now. In most Android phones running Nougat and later, you'll see a on/off toggle at the top of the screen, which will let you switch off Developer options. The screen will grey out, and once you leave, it'll be gone from your phone. To get it back, you'll need to follow these steps again.

HOW TO Install Google Play on a Xiaomi Phone

Adding Google services to a Xiaomi phone is easy when you know how. MARIE BLACK walks you through the process

If you didn't buy the Global version of your new Xiaomi phone, you may now be regretting your purchase. It's a great phone, yes, but if you don't speak Chinese you may be struggling without the software. Fortunately it's easy to add all the usual Google services with which you're familiar.

Note that we've installed Google Play on a Note 5A running MIUI 9.5. If you are running an older version

of the OS you may not be able to install the necessary software, so it's worth checking you're running the latest version first.

Update MIUI 8

- Open the Settings app.
- Scroll down to and select 'About phone'.
- Tap the link at the bottom of the screen for 'System updates'.
- Follow the prompts to install any software that may be available.

Update MIUI 9

- Open the Settings app.
- Tap the top link for 'My device'.
- Tap MIUI version.
- Tap Check for updates.
- Follow the prompts to install any software that may be available.

Install Google Play on MIUI 9

Assuming you are now running the latest version of MIUI, you'll need to enable the installation of apps from unknown sources, then install the various Google services required to run Google apps on your phone.

- Open the Settings app.
- Tap on 'Additional settings'.
- Tap on 'Privacy'.
- Toggle on the button for 'Unknown sources'.
- Open the Mi App Store.
- Search for 'Google'.

Open the Mi App Store and type 'Google' to find the Play Store

- Tap Install next to the top result – a 0.2MB file.
- Once installed press Open.
- Tap the large blue circular button on the next screen.
- The installer will run through the installation of the various services required: the Google Services Framework, Google Account Manager, Google Play Services, Google Calendar Sync, Google Contacts Sync, and finally the Google Play Store. Tap Install for each when prompted.
- Once the Play Store has been installed tap Open.
- Enter your Gmail address and password, and agree to the permissions.
- Google Play is now installed on your device, and you can install apps from here as you would on any other phone, including Gmail, YouTube and Google Drive.